FOREST SERVICE --- REGION SIX

WILLAMETTE NATIONAL FOREST

McKENZIE RIVER RANGER DISTRICT

LANE COUNTY, OREGON

PLANS FOR PROPOSED

Ten Timber Sale

ROAD NO.	LENGTH	CONST./RECONST.
2633	3.81	RECONST.

Total Miles 3.81

INDEX TO SHEETS	
SHEET	DESCRIPTION
1	TITLE SHEET
2	VICINITY MAP
3	GENERAL NOTES
4	ESTIMATE OF QUANTITIES
5-8	RECONSTRUCTION SUMMARIES
9	TYPICAL SECTIONS
10	DRAINAGE LISTING
11	DRAINAGE DETAIL
12	DEWATERING PLAN
13	CLEARING TYPICAL

Designed Team:

Kenneth C. Gabriel — 10/20/2011
Name — Date

Reviewed by:

George W. Smith, Jack Wilson — 10/20/2011
Name — Date

Reviewed by:

Ken Roberson — 11/1/2011
Name — Assistant Dev. Engineer — Date

Recommended by:

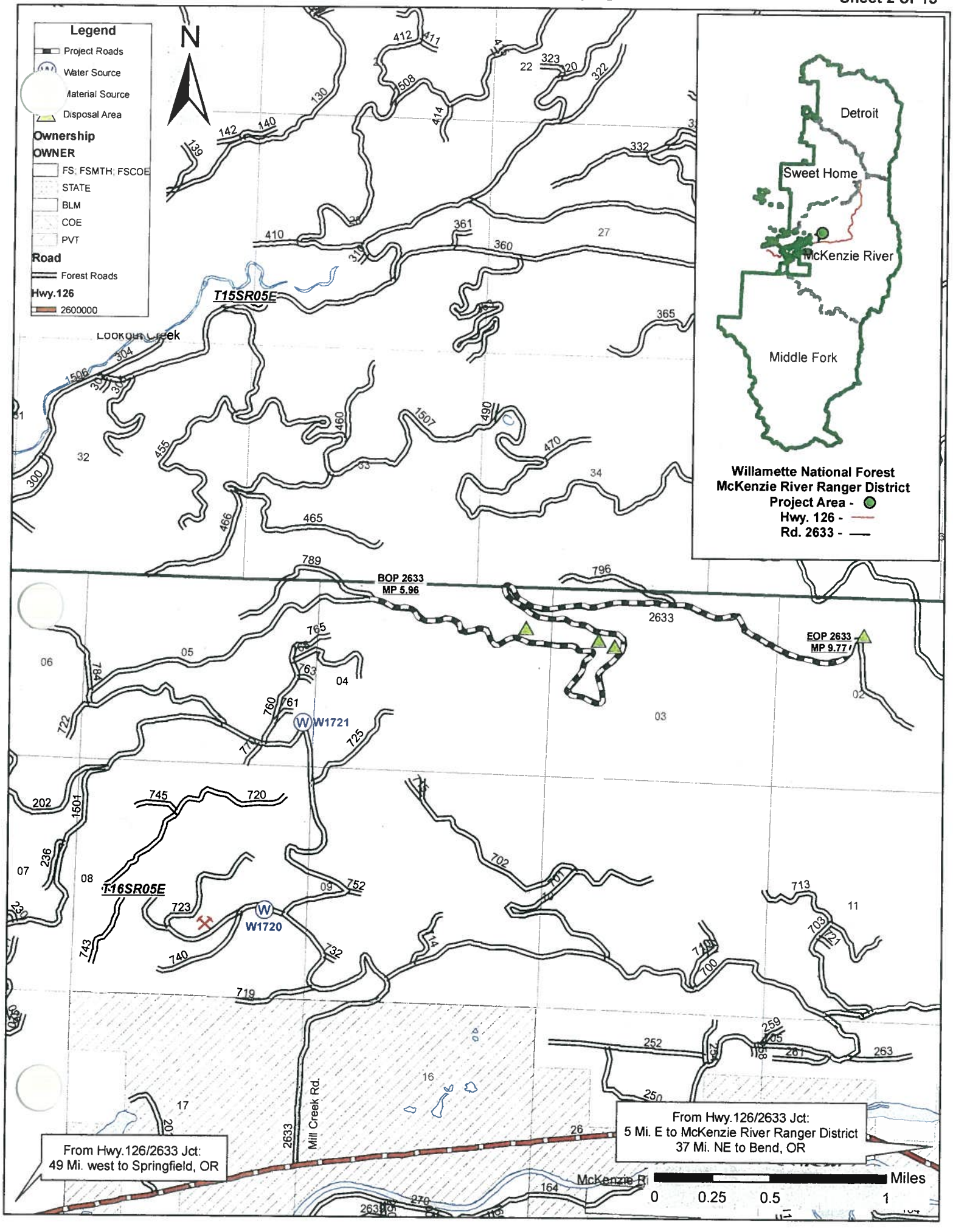
10/25/11
Name — Assistant Zone Engineer — Date

Approved by:

11/1/11
Name — Forest Engineer — Date

10/25/11
Name — District Ranger — Date

Ten Timber Sale



GENERAL NOTES

1) Remove all berms created from roadbed reconditioning or ditch reconstruction to allow for drainage of water. All safety berms are designated to remain.

2) Do not undercut existing backslopes when constructing or reconditioning roadway ditch under pay items 20479 or 30359.

3) Salvage existing aggregate during culvert replacement; use as backfill material.

4) Recondition or reconstruct turnouts and curve widening the same as the basic roadbed. Quantities listed in the estimate of quantities include turnouts and curve widening.

5) See FSSS 107.02 **Protection and Restoration of Property and Landscape** and Timber Sale provisions for restrictions/mitigations related to this project.

6) Designated disposal sites are identified on reconstruction summary sheets. Layer place, smooth and shape to drain excess or unsuitable excavation materials. Additional disposal sites may be identified during construction if the need arises. No other disposal sites will be used, unless designated in advance by the Contracting Officer. Cost for disposal site shaping is indirect to the listed pay items under Sections 204 and 303.

7) Maintain all construction staking on the project, until final inspection and acceptance.

8) Replace culverts when stream channels are dry or during instream work period. Dewatering will be deleted if there is no water in the stream when the work is done.

9) Spread Government furnished straw over disturbed soil at all culvert installations, disposal areas and other exposed soil, excluding ditches. Cover areas completely. Straw is stored at the Horse Creek Work Center, located off Horse Creek road. Contact the CO to arrange for pick up.

10) Submit a written Erosion Control / Dewatering Plan for approval 21 days prior to beginning culvert replacement. Refer to FSSS 157.02 for additional requirements. Dewatering is included under Pay item 15755.

11) Provide class D construction tolerance for Road 2633.

12) Set culvert reference stakes prior to excavation and removal of all culverts shown on the Drainage Listing Sheet as "# match existing" installation. Set a culvert reference stake on the centerline of the culvert 10 feet Record the following on culvert reference stakes: Mile point, actual stake distance from culvert inlet and outlet and existing culvert diameter.

ESTIMATE OF QUANTITIES

		ROAD NUMBER	2633	
		SEGMENT		
		PROJECT LENGTH (Miles)	3.81	
ITEM NO.	DESCRIPTION	Pay Unit	QTY	REMARKS
15101	Mobilization	Lump sum	1	Includes equipment washing, temporary traffic control, and fire protection measures.
15755	Erosion control & pollution prevention	Each	2	Includes dewatering for culvert replacements
20103	Clearing and grubbing, disposal of tops and limbs (f), logs (f), stumps (f)	Mile	3.81	Scatter existing woody debris or blowdown (located within the roadway) outside the clearing limits or as directed by CO.
20207	Removal of individual trees, disposal of tops and limbs (f), logs (f), stumps (f)	Each	8	
20253	Removal of individual trees, miscellaneous: disposal of tops & limbs (f) & logs (f)	Each	79	Fall and leave.
20358	Removal of corrugated metal pipe, disposal method (a)	Each	12	
20302	Removal of culvert inlet / outlet	Foot	5	disposal method (a)
20419A	Drainage excavation, type culvert outlet ditch	Foot*	50	
20419B	Drainage excavation, type leadoff ditch	Foot *	60	
20420	Drainage excavation, type catchbasin	Each	2	
20464	Excavation, compaction method B	Lump sum	1	
20479	Drainage excavation, type roadway ditch	Mile	0.07	
25101	Placed riprap, class 2	Cubic Yard *	18	Material to be collected throughout project area.
30359	Roadway reconditioning, compaction method E	Mile	3.81	
32211	Aggregate surface course, grading T, compaction method B	Cubic Yard *	1725	Material source, Mill Creek Pit.
60276A	18-inch corrugated aluminized steel pipe, 0.064-inch thickness, method B	Foot	386	Staking of culverts is an indirect cost to this pay item.
60276B	24-inch corrugated aluminized steel pipe, 0.064-inch thickness, method B	Foot	36	
60710	Reconditioning drainage structures, culvert inlet or outlet	Each	2	
62509	Mulching, dry method	Lump sum	1	Treat all exposed soil, at culvert installation sites and disposal sites,Includes mulching of entire project included in these plans
	* Designates Contract Quantities			

RECONSTRUCTION SUMMARY
ROAD 2633

Milepost	Reference Point or Work Required	Pay Item
5.96	Reference: Intersection with Road 2633789 Begin Project	
	Begin clearing.	20103
	Begin reconditioning of roadway. Scarify a minimum of 1 " below the depth of all existing potholes, corrugations or surface irregularities. Sod and fine organic materials growing on road surface may be incorporated into surfacing. Grubbing and disposal of all stumps and root masses within the road bed and in the ditch is required unless otherwise noted in the work description. Haul material from the cleaning of ditches, inlets and outlets and slough and slide removal to disposal areas. Scatter all logs and woody debris outside clearing limits.	30359
	Begin placement of crushed aggregate, 3" depth.	32211
6.08	Reference: MP 6, right.	
6.19	Remove existing culvert.	20358
	Install new 18" x 38' culvert,shift inlet to right 10' to a new skew of 105°, Backfilling of existing catchbasin is an indirect cost to item 30359.	60276A
	Reconstruct outlet ditch, 20 feet.	20419A
6.36	Remove existing culvert.	20358
	Install new 18" x 40' culvert.	60276A
	Remove 2 trees at inlet and 1 tree at outlet, to facilitate installation.	20207
6.45	Remove existing culvert.	20358
	Install new 18" x 34' culvert.	60276A
6.64	Existing culvert with minimal cover.	
	Place 10 CY crushed aggregate over installation; blend to adjacent road surfaces to provide a smooth transition.	32211
6.69	Reference: Disposal site / borrow site, left.	
6.72	Remove existing culvert.	20358
	Dewater culvert installation site, and/or prevent erosion and pollution.	15755
	Install new 24" x 36' culvert, lower outlet 6".	60276B
6.78	Existing culvert.	
	Place 5 CY class 2 riprap at outlet as energy dissipator.	25101
6.84	Remove existing culvert, including inlet elbow and down pipe.	20358
	Install new 18" x 32' culvert.	60276A
	Place 2 CY class 2 riprap at outlet as energy dissipator.	25101
6.94	Existing culvert.	
	Place 2 CY class 2 riprap at outlet as energy dissipator.	25101
7.03	Existing culvert.	
	Repair (jack open) culvert inlet; straighten and reform circular opening.	60710

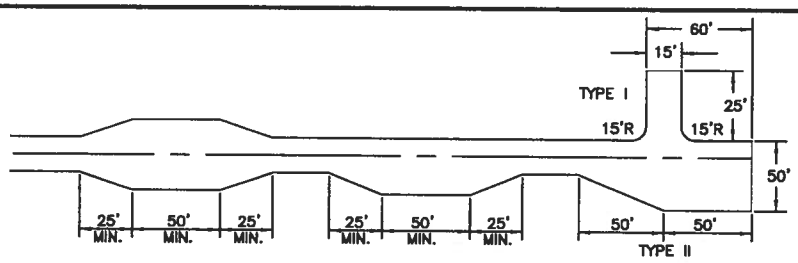
RECONSTRUCTION SUMMARY
ROAD 2633

Milepost	Reference Point or Work Required	Pay Item
7.09	Reference: MP 7, right.	
7.11	Existing culvert.	
	Brush outlet for 10'	20103
	Reconstruct outlet ditch / stream channel, 20 feet.	20419A
7.57	Existing culvert.	
	Reconstruct culvert catchbasin.	20420
	Repair (jack open) culvert inlet; straighten and reform circular opening.	60710
7.63	Remove existing culvert.	20358
	Install new 18" x 36' culvert, lower outlet 6".	60276A
7.69	Reference: Disposal site, left.	
7.73	Reference: Disposal site, left.	
	End placement of crushed aggregate.	
7.89	Existing culvert.	
	Place 2 CY class 2 riprap at outlet as energy dissipator.	25101
8.01	Existing culvert.	
	Remove 5' from culvert outlet.	20302
	Place 2 CY class 2 riprap at outlet as energy dissipator.	25101
8.07	Reference: MP 8, right.	
8.12	Remove existing culvert.	20358
	Install new 18" x 38' culvert.	60276A
	Place 1 CY class 2 riprap at outlet as energy dissipator.	25101
	Place 10 CY crushed aggregate over installation; blend to adjacent road surfaces to provide a smooth transition.	32211
8.19	Remove existing culvert.	20358
	Install new 18" x 34' culvert.	60276A
	Place 2 CY class 2 riprap at outlet as energy dissipator.	25101
	Place 10 CY crushed aggregate over installation; blend to adjacent road surfaces to provide a smooth transition.	32211
8.35 to 8.37	Shoulder Failure, narrow roadway	
	Realign travel way into hillslope 3' wide x 40' long from existing hinge point with a back slope of 1:1, exact loaction to be staked within segment.	20464
	Eliminate existing ditch through full segment and grade to achive a minimum 12' wide travel way with a 3% inslope. Blend new back slope to existing.	30359
	Place 20 CY crushed aggregate at a 4" depth, blend to adjacent road surfaces to provide a smooth transition.	32211

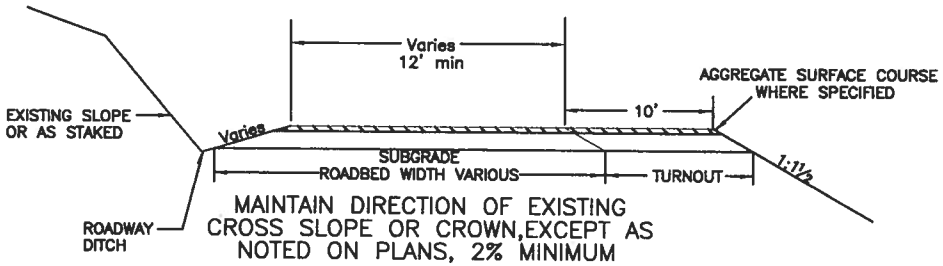
RECONSTRUCTION SUMMARY
ROAD 2633

Milepost	Reference Point or Work Required	Pay Item
8.38	Remove existing culvert. Install new 18" x 30' culvert. Place 1 CY class 2 riprap at outlet as energy dissipator. Begin constructing roadway ditch, right. Place 10 CY crushed aggregate over installation; blend to adjacent road surfaces to provide a smooth transition.	20358 60276A 25101 20479 32211
8.39	Remove 4 green trees, to facilitate ditch construction, right.	20207
8.44	Reconstruct leadoff ditch, left 60 feet. Begin placement of crushed aggregate, 6" depth.	20419B 32211
8.45	End constructing roadway ditch, right.	
8.56	Reduce aggregate placement to 3" depth	32211
8.6 to 8.61	Shoulder Failure, narrow roadway Realign travelway to hillslope hinge point and eliminate existing ditch. Grade to achive a minimum 12' wide travel way with a 3% inslope. Place new aggregate from hillslope hinge point to fillslope hinge point.	30359
8.60	Remove existing culvert. Install new 18" x 32' culvert,shift inlet to right 10' to a new skew of 110°, Backfilling of existing catchbasin is an indirect cost to item 30359.	20358 60276A
8.72	Remove existing culvert. Dewater culvert installation site, and/or prevent erosion and pollution. Install new 18" x 34' culvert. Place 1 CY class 2 riprap at outlet as energy dissipator.	20358 15755 60276A 25101
8.78	Remove existing culvert. Remove 1 tree at outlet, to facilitate installation. Install new 18" x 38' culvert. End placement of crushed aggregate.	20358 20207 60276A
9.08	Existing culvert. Construct outlet ditch, 10 feet.	20419A
9.20	Reference: Intersection with Road 2633796, left.	
9.38	Existing culvert. Reconstruct culvert catch basin.	20420
9.77	End of project.	

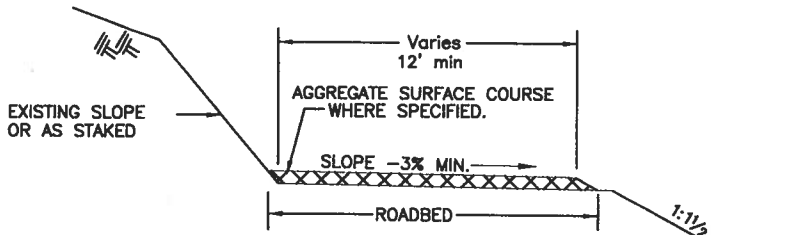
Milepost	Reference Point or Work Required	Pay Item
	DANGER TREE REMOVAL LIST	20253
6.14	3 danger trees, right.	
6.27	1 danger tree, left, 3 danger trees, right.	
6.30	1 danger tree, right.	
6.37	1 danger tree, right.	
6.47	1 danger tree, left.	
6.57	3 danger trees, left.	
6.60	1 danger tree, left.	
6.61	1 danger tree, right.	
6.82	2 danger trees, left.	
6.84	1 danger tree, left.	
6.88	7 danger trees, left.	
6.92	1 danger tree, left.	
6.95	1 danger tree, right.	
7.06	1 danger tree, left.	
7.10	1 danger tree, left.	
7.16	1 danger tree, right.	
7.23	1 danger tree, right.	
7.25	1 danger tree, right.	
7.32	2 danger trees, right.	
7.47	2 danger trees, right.	
7.54	2 danger trees, right.	
7.61	2 danger trees, left, 1 danger tree, right.	
7.82	2 danger trees, left.	
7.91	1 danger trees, left.	
7.95	2 danger trees, left.	
8.10	1 danger tree, left.	
8.11	1 danger tree, right.	
8.17	1 danger tree, left, 1 danger tree, right.	
8.26	2 danger trees, left.	
8.34	1 danger tree, right.	
8.68	1 danger tree, right.	
8.69	2 danger trees, left.	
8.75	2 danger trees, right.	
8.80	1 danger tree, right.	
8.93	2 danger trees, right.	
8.97	2 danger trees, left.	
9.22	3 danger trees, left.	
9.32	3 danger trees, right.	
9.45	1 danger tree, left.	
9.51	2 danger trees, right.	
9.60	2 danger trees, right.	
NOTE:	Remove 5 danger trees (to be field identified)	



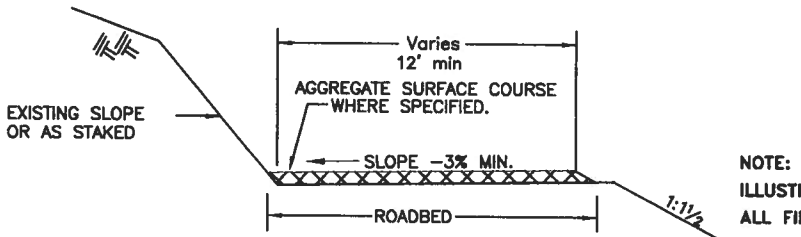
DOUBLE LANE OR SPLIT TURNOUT | TURNOUT | TURNAROUND



TYPICAL SINGLE, DOUBLE LANE, TURNOUT AND TURNAROUND



TYPICAL OUTSLOPE SECTION

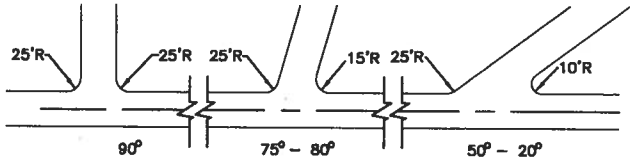


TYPICAL INSLOPE SECTION

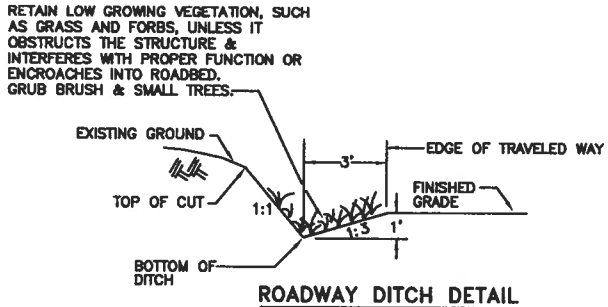
C = CROWNED
I = INSLOPED
O = OUTSLOPED

NOTE:
ILLUSTRATED SLOPE RATIO = RISE:RUN (WHERE RISE =1)
ALL FILL SLOPES TO BE 1:11/2 UNLESS NOTED OTHERWISE

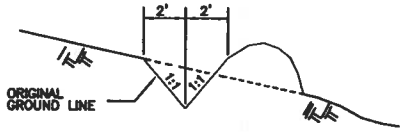
NOT TO SCALE



TYPICAL INTERSECTION



ROADWAY DITCH DETAIL



TYPICAL LEADOFF DITCH AND FURROW DITCH

AGGREGATE SURFACE COURSE

ROAD NO.	GRADING	TYPICAL SECTION	M.P. LOCATION	DEPTH	TRAVELED WAY WIDTH	ROCK SLOPE
2633000	T	C	5.96 – 7.73	3"	12'	1:2
2633000	T	I	8.35 – 8.37	4"	12'	1:2
2633000	T	I	8.44 – 8.56	6"	12'	1:2
2633000	T	C	8.56 – 8.60	3"	12'	1:2
2633000	T	I	8.60 – 8.61	3"	12'	1:2
2633000	T	C	8.61 – 8.78	3"	12'	1:2

See Reconstruction Summaries for culvert installation spot surfacing locations

TYPICAL SECTIONS

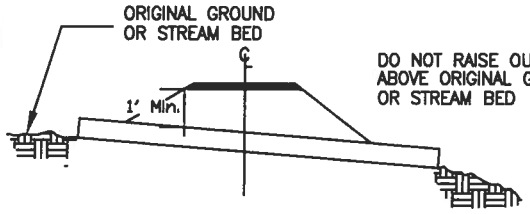
STATE	FOREST	PROJECT	SHEET NUMBER	TOTAL SHEETS
OREGON	WILLAMETTE	TEN TIMBER SALE	9	13

DRAINAGE LISTING

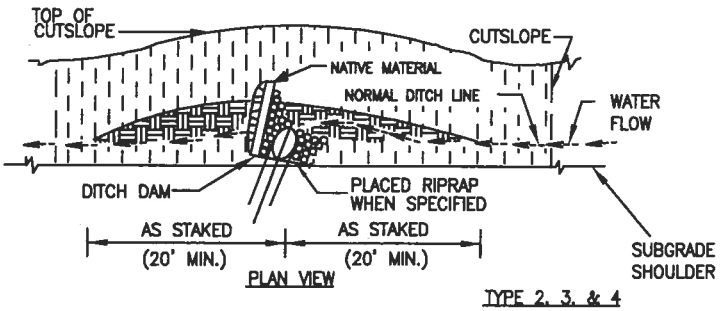
		Remove	As Built		Date	DIMENSION		Installation Details					
ROAD NO. 2633	FEET +	EACH -	Sta.	FEET		SIZE in.	THICK in. FE	Inlet Basin or Catch Basin	Outlet Ditch Feet	SKEW Deg	GRADE %	C.Y. Riprap	REMARKS
Mile Point													
6.19	38	1				18	0.064		20	105			Shift inlet right 10' to a new skew of 105°
6.36	40	1				18	0.064			#	#		
6.45	34	1				18	0.064			#	#		
6.72	36	1				24	0.064			#			Lower outlet 6"
6.78												5	Class 2 riprap, as energy dissipator.
6.84	32	1				18	0.064					2	Class 2 riprap, as energy dissipator.
6.94												2	Class 2 riprap, as energy dissipator.
7.03													Repair culvert inlet; reform circular opening.
7.11									20				Brush Outlet for 10'
7.57								Rec.					Repair culvert inlet; reform circular opening.
7.63	36	1				18	0.064			#			Lower outlet 6"
7.89												2	Class 2 riprap, as energy dissipator.
8.01												2	Class 2 riprap, as energy dissipator. Remove 5' from outlet end of existing culvert.
8.12	38	1				18	0.064			#	#	1	Class 2 riprap, as energy dissipator.
8.19	34	1				18	0.064			#	#	2	Class 2 riprap, as energy dissipator.
8.38	30	1				18	0.064			#	#	1	Class 2 riprap, as energy dissipator.
8.60	32	1				18	0.064			110			Shift inlet right 10' to a new skew of 110°
8.72	34	1				18	0.064			#	#	1	Class 2 riprap, as energy dissipator.
8.78	38	1				18	0.064			#	#		
9.08									10				
9.38								Rec.					
# Match Existing		Rec.= Reconstruct.											

THE ABOVE INSTALLATIONS TO INCLUDE CONNECTING BANDS. ALL MATERIAL SHALL BE ALUMINIZED STEEL.

NOTE: Standard pipe corrugation will be 2-2/3" x 1/2" unless otherwise noted. Bevel pipe ends 1v :1 1/2h, where indicated.
Some culvert installations listed above may require additional excavation below grade line.

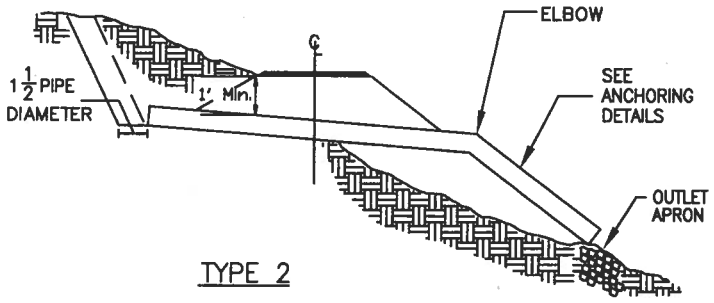


TYPE 1

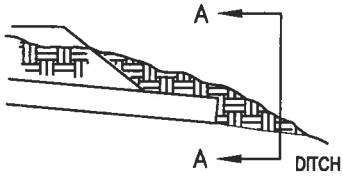


TYPE 2, 3, & 4
CULVERT INSTALLATION

CATCHBASIN DETAIL

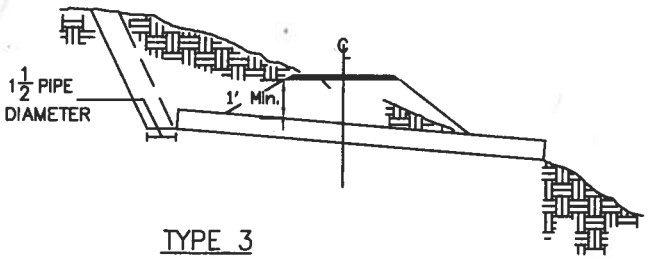


TYPE 2

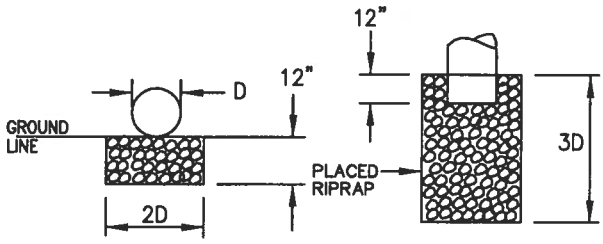


OUTLET DITCH

SECTION A–A

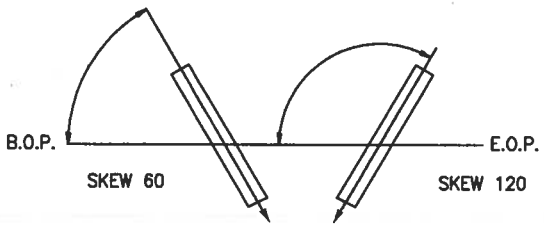


TYPE 3



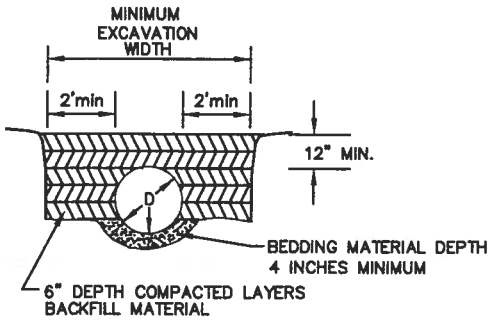
CONSTRUCT APRON SURFACE WITH
PROTRUDING RIPRAP FOR VELOCITY
BREAK.

ENERGY DISSIPATOR



SKEW DIAGRAM

B.O.P.= BEGINNING OF PROJECT
E.O.P.= END OF PROJECT

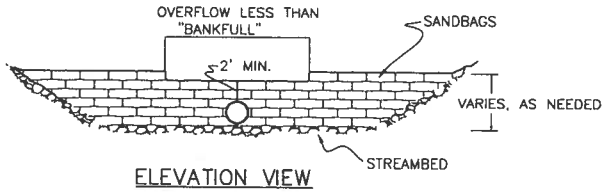


TYPICAL BEDDING AND BACKFILL DETAIL

NOT TO SCALE

DRAINAGE DETAIL

STATE	FOREST	PROJECT	SHEET NUMBER	TOTAL SHEETS
OREGON	WILLAMETTE	TEN TIMBER SALE	11	13

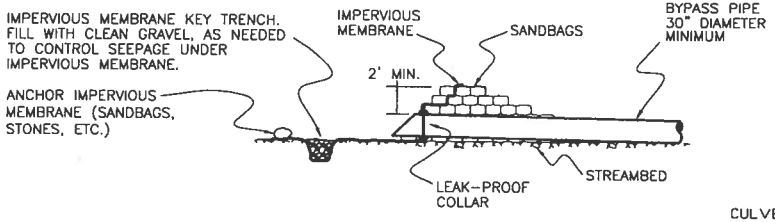


ELEVATION VIEW

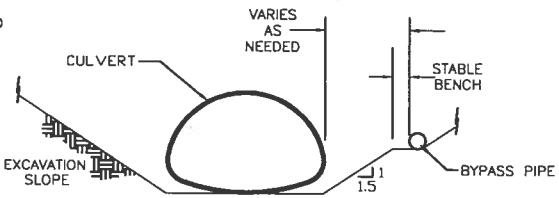
NOTES:

THE DEWATERING & SEDIMENT CONTROL PLAN SHOWS THE MINIMUM ACCEPTABLE CRITERIAL. MAINTAINING CLEAN WATER DOWNSTREAM OF THE PROJECT IS THE RESPONSIBILITY OF THE CONTRACTUR FOR THE DURATION OF THE PROJECT.

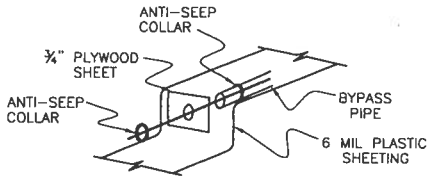
MAINTAIN PUMPING CAPACITY EQUAL TO STREAM FLOW, UNTIL THE STREAM IS FLOWING ON THE APPROVED, FINISHED STREAMBED.



PROFIILE VIEW

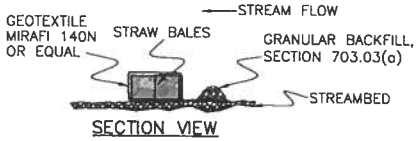


TYPICAL SECTION A-A

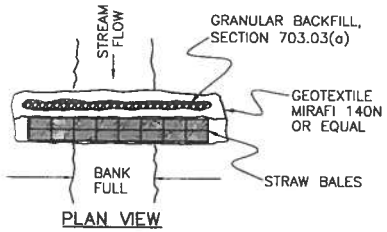


ANTI-SEEP COLLAR DETAIL

SANDBAG BYPASS DAM DETAILS

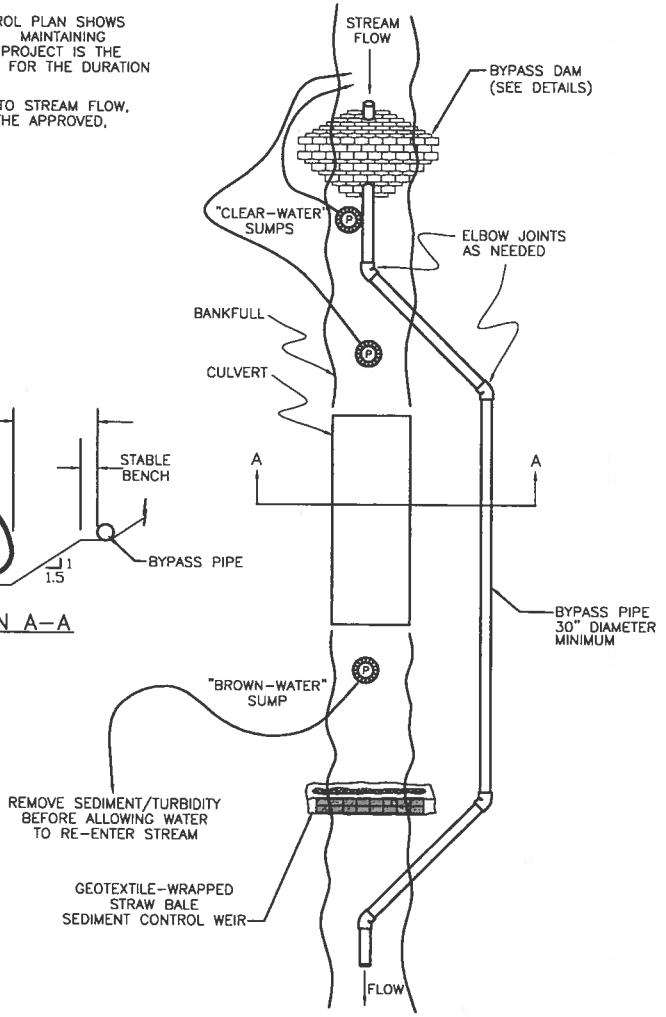


SECTION VIEW



PLAN VIEW

GEOTEXTILE-WRAPPED STRAW BALE SEDIMENT CONTROL WEIR

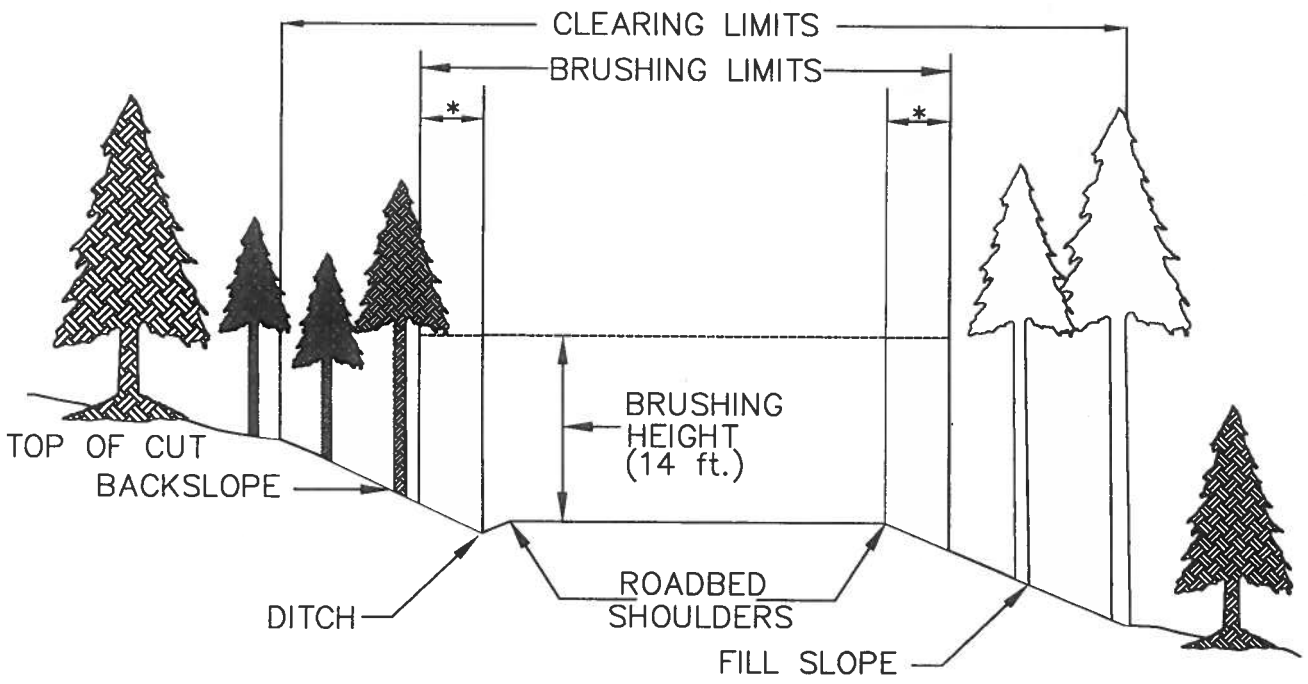


BYPASS TYPICAL PLAN VIEW

NOT TO SCALE

DEWATERING PLAN

STATE	FOREST	PROJECT	SHEET NUMBER	TOTAL SHEETS
OREGON	WILLAMETTE	TEN TIMBER SALE	12	13



N.T.S.

NOTES

1. Remove all vegetative growth inside the brushing limits, from the shoulders of the road or the bottom of the ditch, to a maximum height of 6 inches above ground surfaces.

2. Trees larger than 6 inches in diameter (when measured 6 inches above the ground) that do not interfere with ditch and surface maintenance are designated to remain.

3. Trim limbs on remaining trees from ground level to a clearing height limit of 14 feet above the travelway surface.

4. C[illegible]areas designated in reconstruction summaries.

* BRUSHING LIMITS		
ROAD NO.	M.P. LOCATION OR STATION	BRUSHING WIDTH
2633000	5.96 – 9.77	4'

CLEARING TYPICAL

STATE	FOREST	PROJEC[illegible]	SHEET NUMBER	TOTAL SHEETS
OREGON	WILLAMETTE	TEN TIMBER SALE	13	13

Willamette National Forest
Timber Sale: **TEN**

Prepared By: K.Gabriel
Date: **10/25/2010**
Edited by

Road No.	Road Name	TRAFFIC SERVICE LEVEL	MAINT. LEVEL	Design Class	Approx. Mi./km	C/R *	Specified Road Cost	Required Completion Date
2633	Mill Creek	C	2	SL-12-20	3.81- 6.17	R	$120,062.31	10/31/2012

* C=Construction
R=Reconstruction

Summary of Road Construction/Reconstruction Costs

Specified Roads	$120,062.31
Share Cost Roads	$0.00
Road Engineering Reconst. Deposit Cost	$15,529.00
Total Road Costs	$135,591.31
Contributed Funds	$0.00
Total Timber Sale Road Costs	$135,591.31

Total Estimated Road Construction Cost

Public Works Cost (opted sales)	$135,547.04

Attachments

Schedule of Items	1 pages
Specification Lists	2 pages for Specified Roads, 1 page for TS haul route maintenance
FS Supplemental Specs	47 pages
Road Maintenance T-Specs	10 pages
Plans	13 sheets

* Applicable to Specified Roads only.

SCHEDULE OF ITEMS

		ROAD NUMBER	2633		
		SEGMENT			
		CONSTRUCTION			
		RECONSTRUCTION	X		SPECIFIED ROADS TOTAL
		PROJECT LENGTH (Miles)	3.81		
ITEM NO.	DESCRIPTION	Pay Unit	QTY	UNIT COST	
15101	Mobilization	Lump sum	1	$16,133.99	$16,133.99
15755	Erosion control & pollution prevention	Each	2	$508.28	$1,016.56
20103	Clearing and grubbing, disposal of tops and limbs (f), logs (f), stumps (f)	Mile	3.81	$1,055.97	$4,023.25
20207	Removal of individual trees, disposal of tops and limbs (f), logs (f), stumps (f)	Each	8	$64.84	$518.72
20253	Removal of individual trees, miscellaneous: disposal of tops & limbs (f) & logs (f)	Each	79	$62.36	$4,926.44
20358	Removal of corrugated metal pipe, disposal method (a)	Each	12	$287.85	$3,454.20
20302	Removal of culvert inlet / outlet	Foot	5	$22.46	$112.30
20419A	Drainage excavation, type culvert outlet ditch	Foot*	50	$4.32	$216.00
20419B	Drainage excavation, type leadoff ditch	Foot *	60	$3.82	$229.20
20420	Drainage excavation, type catchbasin	Each	2	$71.26	$142.52
20464	Excavation, compaction method B	Lump sum	1	$698.55	$698.55
20479	Drainage excavation, type roadway ditch	Mile	0.07	$4,031.58	$282.21
25101	Placed riprap, class 2	Cubic Yard *	18	$86.80	$1,562.40
30359	Roadway reconditioning, compaction method E	Mile	3.81	$1,918.32	$7,308.80
32211	Aggregate surface course, grading T, compaction method B	Cubic Yard *	1725	$37.38	$64,480.50
60276A	18-inch corrugated aluminized steel pipe, 0.064-inch thickness, method B	Foot	386	$32.78	$12,653.08
60276B	24-inch corrugated aluminized steel pipe, 0.064-inch thickness, method B	Foot	36	$39.93	$1,437.48
60710	Reconditioning drainage structures, culvert inlet or outlet	Each	2	$45.66	$91.32
62509	Mulching, dry method	Lump sum	1	$774.79	$774.79
	* Designates Contract Quantities			Total	$120,062.31

Cost Estimate Worksheet for Reconstruction Engineering Services C5.213#

Sale Name TEN TIMBER SALE

PRECONSTRUCTION ENGINEERING: All engineering work and expense of preparing for reconstruction engineering services, including the following:

		Cost ($)
1.	Transportation Planning. (All work necessary to complete the NEPA document and decision.)	XXXXXXX
2.	Engineering investigations, studies and reports, and reconnaissance, location, etc.	$ 1,280.00
3.	Preliminary location surveys.	$ 1,280.00
** 4.	Soils, foundations, and materials investigations, surveys, tests, structural design and review.	$ 840.00
5.	Preliminary and final designs.	$ 1,280.00
6.	Preliminary and final plans, drawings, spec's, and estimates of quantities.	$ 1,280.00
7.	Preparation of Government cost estimate.	XXXXXXX
8.	Final location surveys staked on the ground.	$ 800.00
9.	Rights-of-way surveys, plans, and descriptions.	$ -
** 10.	FE review and approval.	$ 800.00
11.	Other (describe) _____	$ -

CONSTRUCTION ENGINEERING: All work and expense of setting out, controlling, inspecting and measuring the reconstruction of a forest development transportation facility including:

1.	Construction surveys to establish line and grade for the work, to control the work, and to measure quantities.	$ 2,400.00
2.	Redesigning, adjusting, and changing the plans, specifications, etc., to meet encountered conditions.	$ 2,400.00
3.	Inspecting and controlling operations for compliance with plans and specifications.	XXXXXXX
4.	Inspecting and testing materials to be installed.	XXXXXXX
5.	Inspecting and measuring completed work.	XXXXXXX
6.	Processing payments and accepting materials and work.	XXXXXXX
** 7.	FE inspection and construction mgt. (include structures).	$ 800.00

I.	Project Subtotal (Total of 1-10 and 1-7 above)	$ 13,160
II.	S.O. Overhead Account (V+IV)*.18	$ 2,369
III.	Project Total = (I + II)	$ 15,529
IV.	** FE Account (4+10+7)	$ 2,440
V.	District Account = (I - IV)	$ 10,720
VII.	Total (I + II) **To C5.213#** →	$ 15,529 FSRE18

Assistant Forest Engineer _____ Date _____

NOTE: Do not include entries where XXXXXXX appears.

EN TIMBER SALE
ENGINEER'S ESTIMATE

11/3/2011
Assumes 2% per annum inflation rate.

Note: This is an in-house tool,
NOT PART OF THE CONTRACT. /s/

Costs projected to midpoint of construction period, 2012, 9 months from 10/17/2012 1.02 factor

	2633								
PAY ITEM	DESCRIPTION	PAY UNIT	QTY	P.W. Unit Price	Adjusted PW Unit Cost	Public Works Total Cost	T.S.Unit Price	ADJUSTED T.S. UNIT COST	Timber Sale Total Cost
15101	Mobilization	LS	1	$17,803.03	$18,426.14	$18,426.14	$15,895.56	$16,133.99	$16,133.99
15755	Erosion control & pollution prevention	Each	2	$600.52	$612.53	$1,225.06	$500.77	$508.28	$1,016.56
20103	Clearing & grubbing, disposal of tops and limbs (f), logs (f), stumps (f)	Mile	3.81	$1,225.99	$1,250.51	$4,764.44	$1,040.36	$1,055.97	$4,023.25
20207	Removal of individual trees, disposal of tops and limbs (f), logs (j), stumps (f)	Each	8	$85.51	$87.22	$697.76	$63.88	$64.84	$518.72
20253	Removal of individual trees, miscellaneous: disposal of tops and limbs (f) & logs (f)	Each	79	$88.42	$90.19	$7,125.01	$61.44	$62.36	$4,926.44
20358	Removal of corrugated metal pipe, dosposal method (a)	Each	12	$368.76	$376.14	$4,513.68	$283.60	$287.85	$3,454.20
20302	Removal of culvert inlet/outlet	Each	5	$27.22	$27.76	$138.80	$22.13	$22.46	$112.30
20419A	Drainage excavation, type culvert outlet ditch	Foot*	50	$6.04	$6.16	$308.00	$4.26	$4.32	$216.00
20419B	Drainage excavation, type leadoff ditch	Foot*	60	$5.11	$5.21	$312.60	$3.76	$3.82	$229.20
20420	Drainage excavation, type catchbasin	Each	2	$94.35	$96.24	$192.48	$70.21	$71.26	$142.52
20464	Excavation, compaction method B	Lump sum	1	$877.04	$894.58	$894.58	$688.23	$698.55	$698.55
20479	Drainage excavation, type roadway ditch	Mile	0.07	$5,157.86	$5,261.02	$368.27	$3,972.00	$4,031.58	$282.21
25101	Placed riprap, class 2	Cubic Yard*	18	$118.82	$121.20	$2,181.60	$85.52	$86.80	$1,562.40
30359	Roadway reconditioning, compaction method E	Mile	3.81	$2,149.61	$2,192.60	$8,353.81	$1,889.97	$1,918.32	$7,308.80
32211	Aggregate surface course, grading T, compaction B	Cubic Yard*	1725	$38.96	$39.74	$68,551.50	$36.83	$37.38	$64,480.50

60276A	18-inch corrugated aluminized steel pipe, 0.064-inch thickness, method B	Foot	386	$36.69	$37.42	$14,444.12	$32.30	$32.78	$12,653.08
60276B	24-inch corrugated aluminized steel pipe, 0.064-inch thickness, method B	Foot	36	$47.65	$48.60	$1,749.60	$39.34	$39.93	$1,437.48
60710	Reconditioning drainage structures, culvert inlet or outlet	Each	2	$64.75	$66.05	$132.10	$44.99	$45.66	$91.32
62509	Mulching, dry method	Lump sum	1	$1,144.60	$1,167.49	$1,167.49	$763.34	$774.79	$774.79
			2633000	PUBLIC WORKS TOTAL		$135,547.04	TIMBER SALE TOTAL		$120,062.31

SALE SUMMARY:

			Public Works	Timber Sale
	2633000	TOTAL	$135,547.04	$120,062.31
TOTAL FOR SALE =			$135,547.04	$120,062.31

FP-03 SPECIFICATIONS

Specification and Supplemental Specification List

Ten Timber Sale

Shaded numbers denote FP-03 standard specifications

Road Number		2633	---	---	---
Location		---	---	---	---
Seg. Length (miles)		3.81	---	---	---
Construction		---	---	---	---
Reconstruction		X	---	---	---

Standard Spec. or FSSS Number	Title	Latest Revision Date	Specifications referenced, but not listed below, are included by reference. "X" denotes applicable standard specs or supplemental specifications.			
Preface		3/15/04	X			
101	**Terms, Format, and Definitions**	**2003**	**X**			
101.01	Meaning of Terms	1/22/09	X			
101.01	Meaning of Terms	1/22/09	X			
101.03	Abbreviations	6/16/06	X			
101.04	Definitions	3/29/07	X			
101.04	Definitions	11/06/07	X			
102	**Bid, Award, and Execution of Contract**	**2003**	**X**			
102.00	Bid, Award, and Execution of Contract	2/16/05	X			
103	**Scope of Work**	**2003**	**X**			
103.00	Deletions	2/16/05	X			
104	**Control of Work**	**2003**	**X**			
104.00	Deletions	6/16/06	X			
104.03	Specifications and Drawings	1/22/09	X			
104.06	Use of Roads by Contractor	2/17/05	X			
105	**Control of Material**	**2003**	**X**			
105.02	Government Provided Sources	2/17/05	X			
105.02	Material Sources	1/18/07	X			
105.02	Government Provided Sources	2/17/05	X			
105.02	Contractor Provided Sources	03/08/07	X			
105.05	Use of Material Found in the Work	5/12/04	X			
106	**Acceptance of Work**	**2003**	**X**			
106.01	Conformity with Contract Requirements	7/31/07	X			
106.07	Delete	5/11/04	X			
107	**Legal Relations and Responsibility to the Public**	**2003**	**X**			
107.02	Protection and Restoration of Property & Landscape	2/17/05	X			
107.05	Responsibility for Damage Claims	5/11/04	X			
107.06	Contractor's Responsibility for Work	6/16/06	X			
107.08	Sanitation, Health, and Safety	3/29/05	X			
107.09	Legal Relationship of the Parties	6/16/06	X			
108	**Prosecution and Progress**	**2003**	**X**			
108.00	Prosecution and Progress	2/16/05	X			
109	**Measurement and Payment**	**2003**	**X**			
109.00	Deletions	2/17/05	X			
109.02	Measurement Terms and Definitions	6/16/06	X			
151	**Mobilization**	**2003**	**X**			
156.00	Public Traffic	4/17/07	X			
157	**Soil Erosion Control**	**2003**	**X**			
157.03	Construction Requirements	1/29/09	X			
170.00	Develop Water Supply and Watering	3/26/07	X			
201	**Clearing and Grubbing**	**2003**	**X**			
201.00	Material	8/05/09	X			
201.01	Description	2/18/05	X			
201.04	Clearing	2/18/05	X			
201.04	Clearing	2/22/05	X			
201.04	Construction Requirements	3/03/05	X			
201.06	Disposal	11/09/05	X			
201.06	Disposal	2/18/05	X			

FP-03 SPECIFICATIONS

Specification and Supplemental Specification List

Ten Timber Sale

Shaded numbers denote FP-03 standard specifications

Road Number		2633	---	---	---
Location		---	---	---	---
Seg. Length (miles)		3.81	---	---	---
Construction		---	---	---	---
Reconstruction		X	---	---	---

Standard Spec. or FSSS Number	Title	Latest Revision Date	Specifications referenced, but not listed below, are included by reference. "X" denotes applicable standard specs or supplemental specifications.			
202	Additional Clearing and Grubbing	2003	X			
203	emoval of Structures and Obstructions	2003	X			
203.01	Description	2/25/05	X			
203.04	Removing Material	2/18/05	X			
203.05	Disposing of Material	2/18/05	X			
203.05	Disposing of Material	3/26/07	X			
203.08	Payment	2/24/05	X			
204	Excavation and Embankment	2003	X			
204.00	Excavation and Embankment	2/11/08	X			
209.07	Dewatering	7/12/07	X			
209.10	Backfill	5/01/07	X			
251	Riprap	2003	X			
251.03	Construction Requirements	8/05/09	X			
303	Road Reconditioning	2003	X			
303.01	Work	3/02/05	X			
303.05	Roadbed Reconditioning	3/26/07	X			
303.06	Aggregate Surface Reconditioning	4/04/07	X			
303.10	Measurement	3/26/07	X			
303.11	Measurement	3/29/05	X			
322.00	Minor Aggregate Courses	10/24/07	X			
602	Culverts and Drains	2003	X			
602.03	General	9/06/05	X			
602.03	General	10/02/08	X			
602.03	General	3/17/10	X			
607	Cleaning, Reconditioning, and Repairing Existing Drainage Structures	2003	X			
607.06	Reconditioning Drainage Structures	03/26/07	X			
625	Turf Establishment	2003	X			
625.08	Mulching	1/29/09	X			
703.05	Aggregate	8/14/09	X			
704.02	Bedding Material	04/24/08	X			
704.03	Backfill Material	03/26/07	X			

Preface

Preface_wo_03_15_2004_m

Delete all but the first paragraph and add the following:

The Forest Service, US Department of Agriculture has adopted FP-03 for construction of National Forest System Roads.

101 - Terms, Format, and Definitions

101.01_nat_us_01_22_2009

101.01 Meaning of Terms
Delete all references to the TAR (Transportation Acquisition Regulations) in the specifications.

101.01_nat_us_01_22_2009

101.01 Meaning of Terms
Delete all references to the FAR (Federal Acquisition Regulations) in the specifications.

101.03_nat_us_06_16_2006

101.03 Abbreviations.

Add the following to (a) Acronyms:

AFPA	American Forest and Paper Association
MSHA	Mine Safety and Health Administration
NIST	National Institute of Standards and Technology
NESC	National Electrical Safety Code
WCLIB	West Coast Lumber Inspection Bureau

Add the following to (b) SI symbols:

mp	Milepost
ppm	Part Per Million

101.04 Definitions.

Delete the following definitions and substitute the following:

Bid Schedule--The Schedule of Items.

Bridge--No definition.

Contractor--The individual or legal entity contracting with the Government for performance of prescribed work. In a timber sale contract, the contractor is the "purchaser".

Culvert--No definition.

Right-of-Way--A general term denoting (1) the privilege to pass over land in some particular line (including easement, lease, permit, or license to occupy, use, or traverse public or private lands), or (2) Real property necessary for the project, including roadway, buffer areas, access, and drainage areas.

Add the following:

Adjustment in Contract Price--"Equitable adjustment," as used in the Federal Acquisition Regulations, or "construction cost adjustment," as used in the Timber Sale Contract, as applicable.

Change--"Change" means "change order" as used in the Federal Acquisition Regulations, or "design change" as used in the Timber Sale Contract.

Design Quantity--"Design quantity" is a Forest Service method of measurement from the FS-96 *Forest Service Specifications for the Construction of Roads and Bridges.* Under these FP specifications this term is replaced by the term "Contract Quantities".

Forest Service--The United States of America, acting through the Forest Service, U.S. Department of Agriculture.

Neat Line--A line defining the proposed or specified limits of an excavation or structure.

Pioneer Road--Temporary construction access built along the route of the project.

Purchaser--The individual, partnership, joint venture, or corporation contracting with the Government under the terms of a Timber Sale Contract and acting independently or through agents, employees, or subcontractors.

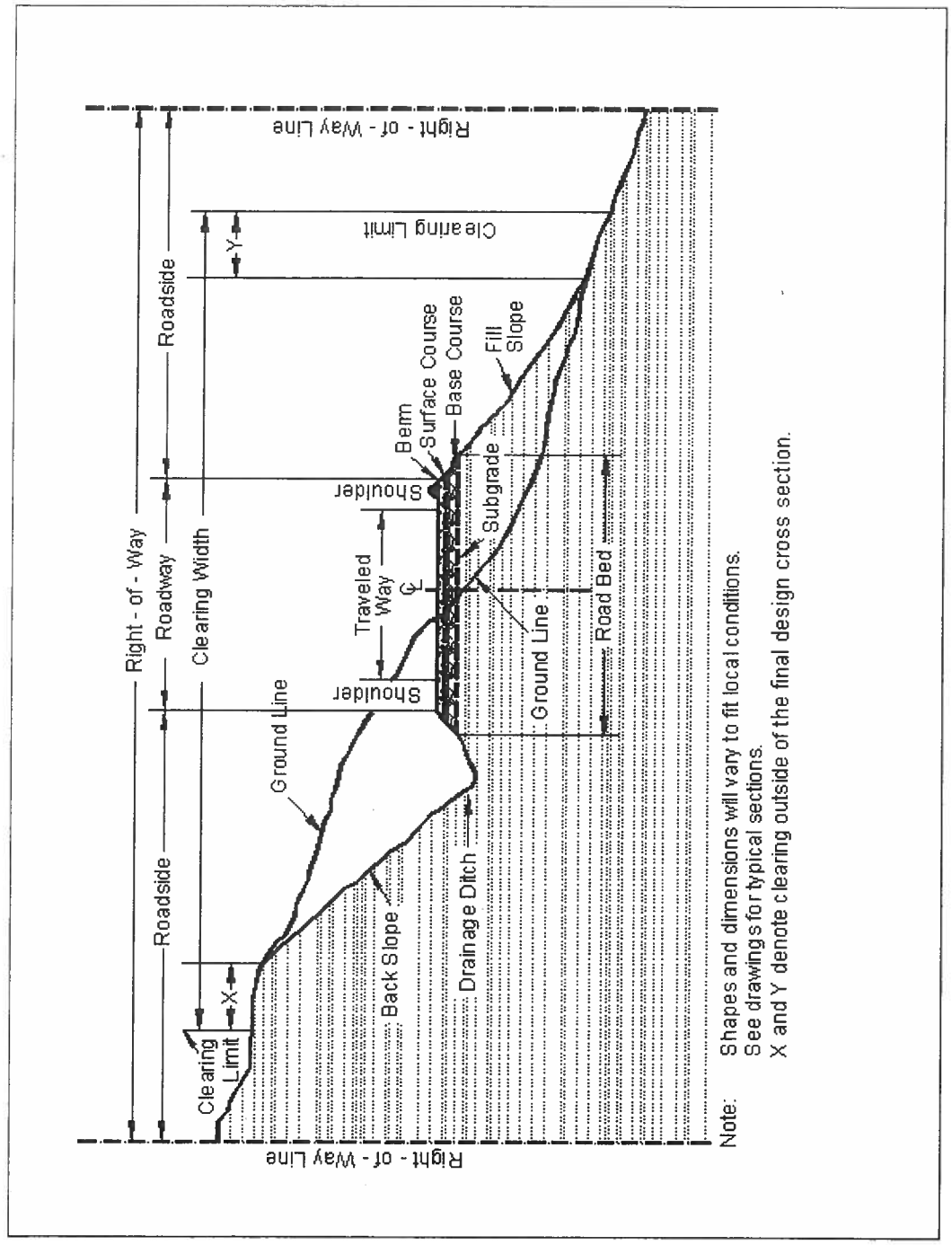
Protected Streamcourse--A drainage shown on the plans or timber sale area map that requires designated mitigation measures.

Road Order--An order affecting and controlling traffic on roads under Forest Service jurisdiction. Road Orders are issued by a designated Forest Officer under the authorities of 36 CFR, part 260.

Schedule of Items--A schedule in the contract that contains a listing and description of construction items, quantities, units of measure, unit price, and amount.

Utilization Standards--The minimum size and percent soundness of trees described in the specifications to determine merchantable timber.

Figure 101-1—Illustration of road structure terms.



101.04_nat_us_11_06_2007

101.04 Definitions.

Delete the following definitions:

Contract Modification

Day

Notice to Proceed

Solicitation

102 - Bid, Award, and Execution of Contract

102.00_nat_us_02_16_2005

102 Bid, Award, and Execution of Contract

Delete Section 102 in its entirety.

103 - Scope of Work

103.00_nat_us_02_16_2005

Deletions

Delete all but subsection 103.01 Intent of Contract.

104 - Control of Work

104.00_nat_us_06_16_2006

Deletions

Delete Sections 104.01, 104.02, and 104.04.

104.03_nat_us_01_22_2009

104.03 Specifications and Drawings.

Delete 104.03.

Add the following subsection:

104.06 Use of Roads by Contractor

The Contractor is authorized to use roads under the jurisdiction of the Forest Service for all activities necessary to complete this contract, subject to the limitations and authorizations designated in the Road Order(s) or described in the contract, when such use will not damage the roads or national forest resources, and when traffic can be accommodated safely.

105 - Control of Material

105.02_nat_us_02_17_2005

105.02(a) Government Provided Sources.

(a) Government-provided sources. Add the following:

Government-provided sources for this project are identified as follows:

(1) Government-provided mandatory sources.

N/A

(2) Government-provided optional sources.

Material for use under item 32232 may be obtained from the Mill Creek Pit. Payment of $17.21 per loose cubic yard will be made to the USDA Forest Service. Contact McKenzie River R.D. for mineral permit information 14 days prior to removal.

105.02_nat_us_01_18_2007

105.02 Material Sources.

105.02(a) Government-provided sources.

Add the following:

Comply with the requirements of 30 CFR 56, subparts B and H. Use all suitable material for aggregate regardless of size unless otherwise designated. When required, re-establish vegetation in disturbed areas according to section 625.

105.02(a) Government Provided Sources.

If the Contractor elects to obtain material from the Mill Creek Pit, the following applies:

(a) The Forest Service will designate material available for purchasers use.

(b) No other material may be used unless written authorization is obtained in advance.

105.02 Material Sources.

105.02(a) Contractor-provided sources.

Add the following:

All material (e.g., soil, gravel, sand, borrow, aggregate, etc.) transported onto National Forest System land or incorporated into the work will be weed-free. The Contracting Officer may request written documentation of methods used to determine the weed-free status of any and all materials furnished by the contractor. Contractor-provided expertise and methods to establish weed-free status must be appropriate for the weeds of concern in the local area. The following applies to this contract:

Weeds specific to this project:

Invasive Plant Species on the Willamette National Forest.: 2010

Potentia vaders	New vaders	Established Infestations
Leafy spurge	Spotted knapweed	Canada thistle
Yellow starthistle	Diffuse knapweed	Bull thistle
Distaff thistle	Yellow toadflax	Scotch broom
Squarrose knapweed	Dalmatian toadflax	Tansy ragwort
Gorse	Japanese knotweed	St. Johns-wort
Orange hawkweed	Meadow knapweed	Foxglove
French broom	Climbing nightshade	Oxeye daisy
Garlic mustard	Field bindweed	
Himalayan knotweed	Evergreen blackberry*	
Milk thistle	Himalayan blackberry*	
Daphnia	False brome	
	Reed canarygrass*	
	Sweetclover	
	Houndstongue	
	English ivy	

Butterfly bush
Yellow hawkweed
Purple loosestrife
Everlasting peavine
Vinca
Evening primrose
Bladder campion
Creeping buttercup
Creeping charlie
Yellowflag iris
Shinyleaf geranium
Sulphur cinquefoil
Herb robert
Depford pink
Burdock
Feverfew
Anise
Fennel
Dead Needle
Yellow Archangel

* Species with a star may be considered either new or established weed infestations, depending on their densities. For example, blackberry at low elevations along river corridors are established, but single clumps at high elevations are newly invading. Reed canary grass around reservoir fringes is established but clumps around alpine lakes are newly invading.

105.05_nat_us_05_12_2004

105.05 Use of Material Found in the Work.

Delete 105.05 (a) and (b) and the last sentence of the second paragraph and substitute the following:

Materials produced or processed from Government lands in excess of the quantities required for performance of this contract are the property of the Government. The Government is not obligated to make reimbursement for the cost of producing these materials.

106 - Acceptance of Work

106.01_nat_us_07_31_2007

106.01 Conformity with Contract Requirements.

Delete Subsection 106.01 and substitute the following:

References to standard test methods of AASHTO, ASTM, GSA, and other recognized standard authorities refer to the methods in effect on the date of solicitation for bids.

Perform all work to the lines, grades, cross-sections, dimensions, and processes or material requirements shown on the plans or specified in the contract.

Incorporate manufactured materials into the work according to the manufacturer's recommendations or to these specifications, whichever is more strict.

Plan dimensions and contract specification values are the values to be strived for and complied with as the design values from which any deviations are allowed. Perform work and provide material that is uniform in character and reasonably close to the prescribed value or within the specified tolerance range. The purpose of a tolerance range is to accommodate occasional minor variations from the median zone that are unavoidable for practical reasons.

When standard manufactured items are specified (such as fence, wire, plates, rolled shapes, pipe conduits, etc., that are identified by gauge, unit mass, section dimensions, etc.), the identification will be considered to be nominal masses or dimensions. Unless specific contract tolerances are noted, established manufacturing tolerances will be accepted.

The Government may inspect, sample, or test all work at any time before final acceptance of the project. When the Government tests work, copies of test reports are furnished to the Contractor upon request. Government tests may or may not be performed at the work site. If Contractor testing and inspection is verified by the Government, the Contractor's results may be used by the Government to evaluate work for acceptance. Do not rely on the availability of Government test results for process control.

Acceptable work conforming to the contract will be paid for at the contract unit bid price. Four methods of determining conformity and accepting work are described in Subsections 106.02 to 106.05 inclusive. The primary method of acceptance is specified in each Section of work. However, work may be rejected at any time it is found by any of the methods not to comply with the contract.

Remove and replace work that does not conform to the contract, or to prevailing industry standards where no specific contract requirements are noted, at no cost to the Government.

(a) Disputing Government test results. **If the accuracy of Government test results is disputed, promptly inform the CO. If the dispute is unresolved after reasonable steps are taken to resolve the dispute, further evaluation may be obtained by written request. Include a narrative describing the dispute and a proposed resolution protocol that addresses the following:**

(1) Sampling method;

(2) Number of samples;
(3) Sample transport;
(4) Test procedures;
(5) Testing laboratories;
(6) Reporting;
(7) Estimated time and costs; and
(8) Validation process.

If the evaluation requires additional sampling or testing be performed, mutually agree with the Government on witnessing procedures and on sampling and testing by a third party laboratory. Use a

third party laboratory accredited by the AASHTO accreditation program. Provide proof of the laboratory's accreditation for the test procedures to be used. Do not use the same laboratory that produced the disputed Government test results or that produced the test results used as a basis for the dispute.

The CO will review the proposed resolution protocol and may modify it before final approval and execution.

The Government will use the approved resolution protocol test results to determine the validity of the disputed testing. If the Government test results are validated, the Contractor will be responsible for all costs associated with developing and performing the resolution protocol. If the Government test results are not validated, the Government will be responsible for all costs associated with developing and performing the resolution protocol. If the validity of the Government test results cannot be determined, the Contractor and Government will equally share all costs associated with developing and carrying out the resolution protocol.

(b) Alternatives to removing and replacing non-conforming work. As an alternative to removal and replacement, the Contractor may submit a written request to:

(1) Have the work accepted at a reduced price; or

(2) Be given permission to perform corrective measures to bring the work into conformity.

The request must contain supporting rationale and documentation. Include references or data justifying the proposal based on an evaluation of test results, effect on service life, value of material or work, quality, aesthetics, and other tangible engineering basis. The CO will determine disposition of the nonconforming work.

106.07_nat_us_05_11_2004

106.07 Delete

Delete subsection 106.07.

107 - Legal Relations and Responsibility to the Public

107.02_nat_us_02_17_2005

107.02 Protection and Restoration of Property and Landscape.

Add the following:

- Replace culverts in live streams between July 1st and August 15th.
- Construction or maintenance of roads will not be done when soils are saturated or run-off occurs, to minimize erosion and sedimentation.

- A seasonal operating restriction is required for the Cascade Elk Rifle season, which is typically the third week of October. All public vehicle traffic would be restricted on closed roads, beginning the Friday before this week, through the end of the following Friday.

107.05_nat_us_05_11_2004

107.05 Responsibility for Damage Claims.

Delete the entire subsection.

107.06_nat_us_06_16_2006

107.06 Contractor's Responsibility for Work.

Delete the following from the first paragraph.

"except as provided in Subsection 106.07".

107.08_nat_us_03_29_2005

107.08 Sanitation, Health, and Safety

Delete the entire subsection.

107.09_nat_us_06_16_2006

107.09 Legal Relationship of the Parties.

Delete the entire subsection.

108 - Prosecution and Progress

108.00_nat_us_02_16_2005

108 Delete.

Delete Section 108 in its entirety.

109 - Measurement and Payment

109.00_nat_us_02_17_2005

109 Deletions

Delete the following entire subsections:

109.06 Pricing of Adjustments.

109.07 Eliminated Work.

109.08 Progress Payments.

109.09 Final Payment.

109.02_nat_us_06_16_2006

109.02 Measurement Terms and Definitions.

(b) Contract quantity.

Add the following:

Contract quantities will be adjusted only when there are errors in the original design of 15% or more.

Change the following:

"(b) Cubic yard" to "(c) Cubic yard".

Add the following definition:

(p) Thousand Board Feet (Mbf). 1,000 board feet based on nominal widths, thickness, and extreme usable length of each piece of lumber or timber actually incorporated in the job. For glued laminated timber, 1,000 board feet based on actual width, thickness, and length of each piece actually incorporated in the job.

156 - Public Traffic

156.00_nat_us_04_17_2007

Delete Section 156 in its entirety and replace with the following:

Description

156.01 This work consists of controlling and protecting public traffic adjacent to and within the project.

Material

156.02 Conform to the MUTCD and the following Sections and Subsections:

Construction sign panels	633
Retro-reflective sheeting	718.01
Temporary concrete barrier	618
Temporary plastic fence	710.11
Temporary traffic control devices	718.22

156.03 General. Unless otherwise provided for in Table 156-1, keep existing roads open to all traffic during road improvement work, and maintain them in a condition that will adequately accommodate traffic. Delays may not exceed 60 minutes at any one time followed by an open period of no less than 10 minutes.

Perform no work that interferes or conflicts with traffic or existing access to the roadway surface until a traffic control plan has been approved. Post construction signs and traffic control devices in conformance with MUTCD. All required signs will be in place and approved prior to beginning work on project.

If the Contractor agrees in writing to allow public traffic to use a new road being constructed prior to completion, it will be considered an existing road for traffic control purposes.

156.04 Temporary Traffic Control. Install and maintain temporary traffic control devices adjacent to and within the project as required by the approved traffic control plan and the MUTCD. Install and maintain traffic control devices as follows:

(a) Furnish and install traffic control devices before the start of construction operations.
(b) All detours outside of clearing limits will be approved in writing by the Contracting Officer as part of the traffic control plan.
(c) Install only those traffic control devices needed for each stage or phase.
(d) Relocate temporary traffic control devices as necessary.
(e) Remove devices that no longer apply to the existing conditions.
(f) Immediately replace any device that is lost, stolen, destroyed, or inoperative.
(g) Keep temporary traffic control devices clean.
(h) Remove all temporary traffic control devices upon contract completion or when approved.

(i) When required, use flaggers certified by the American Traffic Safety Services Association, the National Safety Council, the International Municipal Signal Association, a state agency, or other acceptable organization. Perform the work described under MUTCD Part 6. Use type III, VII, VIII, or IX retroreflective sheeting on flagger paddles. Do not use flags. Flaggers must wear high visibility safety apparel as required by MUTCD 6E.02.

156.05 Temporary Closures. Road segments may be closed as shown in Table 156-1. The maximum consecutive days of closure shall be followed by a minimum number of consecutive days open to traffic as shown. Maintain traffic control devices during closure period(s). Appropriate barricades and signs will be erected and maintained as shown in the traffic control plan or as otherwise designated.

Prior to closing roads during construction, give written notice to the Contracting Officer at least 10 days in advance.

Table 156-1

Temporary Road Closures

Road Number	From Terminus	To Terminus	Maximum Consecutive Days of Closure	Minimum Consecutive Days Open
NONE				

156.06 Acceptance. Public traffic work will be evaluated under Subsection 106.02.

Measurement and Payment

156.07 Do not measure Public Traffic for payment. Compensation is made as an indirect payment.

157 – Soil Erosion Control

157.03_nat_us_01_29_2009

157.03 General. Add the following:

21 days prior to the start of construction, submit a written plan that provides specific sediment control measures to minimize delivery of soil and turbidity into the stream during the construction period. Include the sequence of operations and information on equipment, materials and suppliers. Measures given in the Plans and Supplemental Specifications are minimum requirements, and may be revised only with written approval of the CO.

The turbidity of the water 100-200 feet downstream shall not be visually greater

than the turbidity of the water upstream of the project site.

When this turbidity requirement or other erosion control measures are not met, immediately take corrective action. Cease operations that are causing turbidity and pump the stream around the construction site according to this specification and the Plans until the turbidity requirement can be met. When the interpretation of this requirement is in question, measure turbidity using a turbidity meter as approved by the CO, and provide documentation that operations are in compliance with FAR 52.236-7 Permits and Responsibilities, Section 107.10 Laws to be Observed and Section 107.10 Environmental Protection, and 107.10, including but not limited to the requirements of the National Marine Fisheries Service.

Do not begin work until the necessary controls for that particular phase of work have been implemented. Incorporate all erosion control features into the project at the earliest practicable time, as agreed by the CO.

Operate in a manner that will avoid harm to aquatic organisms whenever possible.

Notify the CO of the intention to dewater the stream, at least 72 hours in advance (not including weekends and holidays). Do not re-route the stream until approved by the CO. The CO will not approve dewatering until a fisheries biologist and other Government personnel are present and prepared to rescue aquatic organisms. Dewater the stream slowly and incrementally in order to facilitate the fish rescue. The rescue operation will generally take several hours.

Do not release water through the newly constructed simulated streambed until approved by the CO. After approval, release water slowly and incrementally over a period of at least one hour, or as approved by the CO. During this time, treat any water that does not meet the requirements of the turbidity standard stated in this specification.

170 - Develop Water Supply and Watering

170.00_0618_us_03_26_2007

Description

170.01 This work consists of developing an acceptable water supply, furnishing, hauling, and applying water.

Materials

170.02 Conform to the following subsection.

Water	725.01.

Construction Requirements

170.03 Development of Supply & Access. Develop water supplies and access to the water supplies as required. Use designated water sources or other approved water sources. Before using non-designated water sources, obtain all necessary permissions, water rights, and permits.

170.04 Equipment.

(a) Water tanks. Provide mobile watering equipment with watertight tanks of known capacity. Provide for positive control of water application from the driver's position.

(b) Juvenile fish protection. All draft hoses being used to withdraw water from any live flowing stream or pond will utilize one of the following methods of screening.

(1) Perforated plate: Screen opening shall not exceed 3/32 or 0.0938-inches.

(2) Profile bar screen: The narrowest dimension in the screen openings shall not exceed 0.0689-inches in the narrowest direction.

(3) Woven wire screen: Screen openings shall not exceed 3/32 or 0.0938-inches in the narrow direction.

All methods shall be cleaned frequently with either wire brushing, flushing or other acceptable method.

170.05 Application. Apply water uniformly without ponding or washing.

170.06 Acceptance. Developing water supplies and watering will be evaluated under Subsections 106.02 and 106.04.

Measurement and Payment

170.07 See Subsection 109.05.

Do not measure develop water supply and watering for payment.

FOREST SERVICE SPECIFICATIONS LIST
FOR MAINTENANCE OF ROADS IN TIMBER SALES
PURSUANT TO C5.31#

Ten Timber Sale

Road Number			2633	2633700	2633701	2633702			
Location			---	---	---	---			
Seg. Length (miles)			9.77	1.03	1.37	0.27			
Maint. Spec. Number	TITLE	Latest Revision Date	"X" denotes applicable Road Maintenance Specifications						
T-803	Snow Removal	2007	X	X	X	X			
T-811	Blading	2007	X	X	X	X			
T-812	Dust Abatement	2007	X						
T-813	Surfacing	2007	X	X	X	X			
T-831 [2]	Ditch Maintenance	2007	X	X	X	X			
T-834 [2]	Drainage Structure Maintenance	2007	X	X	X	X			
T-836	Maintenance for Limited Use	2007							
T-838	Maintenance for High Clearance Use	2007	X	X	X	X			
T-839	Maintenance for High Clearance Use	2007							
T-842	Cutting Roadway Vegetation	2007	X	X	X	X			
T-851	Logging Out	2007	X	X	X	X			
T-854	Treatment and Disposal of Danger Trees	2007	X	X	X	X			
T-891	Water Supply and Watering	2007	X	X	X	X			

Notes:

[2] -- These specifications are referenced by T-838.

Apply water for dust abatement from end of pavement to the intersection of Road 2633700 when ordered by the CO (Mile Post 0.24 to mile 1.06)

T-803 - SNOW REMOVAL (05/07)

803.01 Description

This Section provides for removal of snow from roads to facilitate logging operations and safe use.

803.02 Maintenance Requirements

(1) Erect signs required by the Sign Plan in the SUPPLEMENTAL SPECIFICATIONS.

(2) Perform work in a manner to preserve and protect roads and appurtenances, and prevent erosion damage to roads, streams, and other Forest values.

(3) Do not undercut banks. Do not blade gravel or other surfacing material off the road.

(4) Keep roadbed drainage ditches, drain dips, and culverts functional when needed during operations and upon completion of operations.

(5) Control snow removal to identify the usable traveled way having roadbed support. Reshape over-width plowing as necessary to define the usable width.

(6) Space, construct, and maintain drainage holes in the dike of snow or berm caused by snow removal operations. Place drain holes to obtain surface drainage without discharging on erodible fills.

(7) Close roads to wheeled vehicles at times and in the manner specified in C(T)5.12 or the Road Rules document.

(8) Upon seasonal completion of Purchaser's Operations, effectively block the road by a snow barricade, unless otherwise approved by the Contracting Officer.

(9) Remove snow for either public access or project use as established in the SUPPLEMENTAL SPECIFICATIONS and meet the following requirements:

(a) Removal for Public Access (Method JU) - Remove snow from all of the traveled way, including turnouts, for safe and efficient use for both timber transportation and the public. Remove intruding windfalls, debris, or slough and slide material for the full width of the traveled way and deposit out of drainage's at locations designated by the Contracting Officer.

(b) Removal for Project Use (Method TS) - Remove snow from all or part of the traveled way, including sufficient turnouts for safe and efficient use for timber transportation and to protect the road. Remove intruding windfalls, debris or slough and slide material and dispose of only as necessary to provide passage for timber transportation. Removed materials may be deposited off the traveled way or outside the traveled way at locations designated by the Contracting Officer.

(10) When directed by the Contracting Officer, replace in kind, within sixty (60) days after the start of Normal Operating Season, any surfacing material which has been bladed off the road, unless otherwise agreed. Contracting Officer will notify Purchaser in writing as to the cubic yard equivalent of bladed off material by the start of the normal operating season.

803.03 Equipment

Purchaser may use any type of equipment to remove snow, providing:

a. Type or use of equipment is not restricted in C(T)5.12 or Road Rules document.

b. Equipment is of the size and type commonly used to remove snow and will not cause damage to the road.

c. The use of plows or dozers to remove snow requires written approval by the Contracting Officer. Equip plows or dozers with shoes or runners to keep the dozer blade a minimum of 2 inches above the road surface unless otherwise approved by the Contractor Officer.

803.04 Ice Control

Ice control may be performed by Purchaser when approved by the Contracting Officer in writing. Such approval will include ice control materials, application rates, and any specific requirements of use.

T-811 BLADING (10/07)

811.01 Description

This work consists of surface blading the traveled way to a condition that facilitates traffic and provides proper drainage. Blading includes shaping the crown or slope of travel way, berms, and drainage dips in accordance with this specification. Compaction is required when shown on the ROAD LISTING.

811.02 Maintenance Requirements

A. Timing - Perform surface blading during the contract period as often as needed to provide conditions stated for the maintenance level of the road.

B. General

1. Blade and shape the existing traveled way and shoulders, including turnouts , to produce a surface which is uniform, consistent to grade, and crowned or cross-sloped as indicated by the character of the existing surface, unless otherwise shown in the ROAD LISTING, to at least ½ inch per 1 foot of width, but not more than ¾ inch per 1 foot of width. Thoroughly loosen surfacing material to no less than 2 inches depth or the depth of potholes or corrugations. Scarification to facilitate cutting to the full depth of potholes or corrugations may be elected, but

will be considered incidental to blading. Do not scarify to a depth that will cause contamination of the surfacing.

2. Apply water during blading when sufficient moisture is not present to prevent segregation. Supply, haul, and apply water in accordance with Section T-891.

3. Shape existing native rock or aggregate surfaced drainage dips to divert surface runoff to existing outlet devices, ditches, or discharge locations.

4. Establish a blading pattern which provides a uniform driving surface, retains the surfacing on the roadbed, and provides a thorough mixing of the materials within the completed surface width. Upon final blading, no disturbed rock shall protrude more than 2 inches above the adjacent surface unless otherwise provided in the contract. Remove and place outside the roadbed, material not meeting this dimension so as not to obstruct drainage ways or structures. This material may be scattered off the roadbed if there is free drainage.

5. Where DESIGNATED ON THE GROUND, included in the ROAD LISTING, SHOWN ON THE DRAWINGS or as ordered by the Contracting Officer invasive species of concern prevention practices shall be followed as listed below.

Invasive Species of Concern Prevention Practices
To be filled in by local FS invasive plant specialist, if applicable.

C. Routine Blading

1. Conform to the dimensions SHOWN ON THE DRAWINGS or designated in the SUPPLEMENTAL SPECIFICATIONS upon completion of blading.

2. Shape roadbed width in excess of the dimensions shown only as needed to provide drainage away from the traveled way. Do not remove established grasses and other vegetation from the excess width except as incidental to providing drainage or unless otherwise provided in the contract.

D. Compaction

Roads requiring compaction will be included in the ROAD LISTING. Unless Compaction Method B is designated in the ROAD LISTING, all traveled ways requiring compaction may be compacted by Method A. Compaction shall commence immediately following blading.

Compaction methods are:

Compaction Method A: Breaking track while operating equipment on the traveled way.

Compaction Method B: 7-10 ton pneumatic, steel, or equivalent vibratory roller, operated to cover the full width two (2) times.

E. Undercutting - Undercutting roadway back slope is not permitted.

F. Intersections

At intersections, blade the roadbeds of side roads which are not closed or restricted from vehicular use to ensure smooth transitions.

Signing, cross ditching in the road surface (traveled way), earth berms, or other devices placed to discourage or eliminate use by passenger cars, are field evidence of road closure or restriction. Roads listed for work under Sections T-835, T-836, T-838, or T-839 are considered restricted.

Side roads listed for work under this Section are not restricted.

G. Cleaning of Structures - Do not allow materials resulting from work under this Section to remain on or in structures, such as bridges, culverts, cattle guards, or drainage dips.

H. Berms - Maintain existing berms to the condition of adjacent segments. Do not create new berms.

I. Smooth Blading - Smooth blading may be used as an interim measure to remove loose surfacing material from the wheel paths, and store removed materials in a recoverable windrow, until blade processing as described in this section is feasible. Watering will not be required for smooth blading. Accomplish smooth blading without distorting the existing cross-slope or crown of the traveled way.

Move and store loose surfacing materials on the high side of super-elevated curves and sections with uniform inslope or outslope. In crowned sections, store the material on either or both sides as elected. Windrow and place stored materials to provide not less than 12 feet of smooth traveled way on one-lane segments, or 20 feet of smooth traveled way on two-lane segments, or segments with turnouts. Cut holes through windrows, which may collect water on the road, for drainage at least every 500 feet.

T-813 SURFACING (10/07)

813.01 Description

This work consists of placing surface aggregate as DESIGNATED ON THE GROUND, or as ordered by the Contracting Officer. It includes preparing the area, furnishing, hauling, and placing all necessary materials and other work necessary to blend with the adjacent road cross section.

813.02 Materials

Materials will be Government-furnished when stated in the supplemental specifications.

Materials furnished by the Purchaser shall conform to the gradation and quality requirements of Section 703 of the "Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects FP-03 U.S. Customary Units" and FS supplements to the FP-03.

All materials transported onto National Forest System land shall be free of invasive species of concern. Written documentation of methods used to determine the invasive species of concern free status of any and all materials furnished by the Purchaser shall be submitted to the Contracting Officer before transport of any materials onto National Forest System land.

The Contracting Officer shall have 5 days, excluding weekends and Federal holidays, to review the methods and inspect the materials after the required written documentation is provided by the Purchaser. After satisfactory review and inspection or after such 5 day period, the Purchaser may transport the material onto National Forest System land.

Material or methods appropriate for establishing invasive species of concern free status for the particular invasive species of concern are listed below.

Invasive Species of Concern and Acceptable Methods specific to this project:

Invasive Species of Concern	Acceptable Methods
To be filled in by the local FS invasive plant specialist	To be filled in by the local FS invasive plant specialist

813.03 Maintenance Requirements

A. Thoroughly loosen the area to be surfaced to a minimum depth of 1 inch prior to placement of aggregate.

B. Mixing and Placing

When scheduled coincidentally with work under Section T-811, and included in the SUPPLEMENTAL SPECIFICATIONS, mix surfacing and existing aggregate with water until a uniform mixture is obtained prior to final shaping and compaction.

Otherwise, spread the material on the prepared area in layers no more than 4 inches in depth. When more than one (1) layer is required, shape and compact each layer before the succeeding layer is placed. Upon completion, the surfacing shall reasonably conform to the adjacent cross section and provide smooth transitions in the road profile.

Compaction Methods

Compaction Method A: Breaking track while operating equipment on the traveled way.

Compaction Method B: 7-10 ton pneumatic, steel, or equivalent vibratory roller, operated to cover the full width two (2) times.

Either Method A or B may be used unless Method B is designated in the ROAD LISTING.

T-831 DITCH MAINTENANCE (10/07)

831.01 Description

This Section provides for routine maintenance of various types of ditches to provide a waterway which is unobstructed, as shown on the ROAD LISTING or DESIGNATED ON THE GROUND.

831.02 Maintenance Requirements

A. Maintain ditches by removing rock, soil, wood, and other materials. Maintained ditches shall function to meet the intent of the original design.

B. Undercutting backslopes during removal operations is not permitted.

C. Suitable material up to 4 inches in greatest dimension removed from the ditches may be blended into existing native road surface and shoulder or placed in designated berm.

D. Do not blend material from ditch cleaning operations into aggregate surfaced roads. Do not blade material across aggregate or bituminous surfaced roads, unless approved in writing by the Contracting Officer.

E. Haul material in excess of 831.02 D or subject to 831.02 E to a designated waste area under Section T-832. Remove excess materials temporarily stored on the ditch slope or edge of the shoulder daily.

F. Remove limbs and wood chunks in excess of 12 inches in length or 3 inches in diameter from ditches and place outside the roadway.

G. Clean paved surfaces of all materials resulting from ditch maintenance work.

Shape lead-off ditches to drain away from the traveled way.

Where DESIGNATED ON THE GROUND, included in the ROAD LISTING, SHOWN ON THE DRAWINGS or as ordered by the Contracting Officer invasive species of concern prevention practices shall be followed as listed below.

Invasive Species of Concern Prevention Practices
To be filled in by local FS invasive plant specialist, if applicable.

T-834 DRAINAGE STRUCTURE MAINTENANCE (10/07)

834.01 Description

This work consists of cleaning and reconditioning culverts and other drainage structures.

834.02 Maintenance Requirements

A. Clean drainage structures, inlet structures, culverts, catch basins, and outlet channels specified in the SUPPLEMENTAL SPECIFICATIONS. Clean catch basins by removing the material within the area SHOWN ON THE DRAWINGS.

B. Clean the transition from the ditch line to the catch basin a distance of 10 feet from the catch basin. Clean outlet channels and lead-off ditches a distance of 6 feet. Remove and place debris and vegetation so as to not enter the channel or ditch, or obstruct traffic. Haul debris and vegetation to a designated disposal area in accordance with Section T-832.

C. Hydraulic flushing of drainage structures is not allowed unless provided for in the SUPPLEMENTAL SPECIFICATIONS.

D. Cleaning and reconditioning are limited to the first 3 feet of inlet and outlet, determined along the top of the structure. Recondition culvert inlet and outlet by field methods such as jacking out or cutting away damaged metal which obstructs flow. Treat cut edges with a zinc rich coating, in accordance with AASHTO M 36M and ASTM A 849.

E. Where DESIGNATED ON THE GROUND, included in the ROAD LISTING, SHOWN ON THE DRAWINGS or as ordered by the Contracting Officer invasive species of concern prevention practices shall be followed as listed below.

T-838 MAINTENANCE FOR HIGH CLEARANCE VEHICLE USE (05/07)

838.01 Description

This work consists of making limited use roads passable for project use by Purchaser and providing drainage from the traveled way and roadbed.

838.02 Maintenance Requirements

A. Traveled Way

Purchaser may smooth or fill existing cross ditches and water bars and as approved by the Contracting Officer modify existing road junctions to enable vehicle access. The Purchaser

may perform the following work prior to beginning haul and resumption of haul after an extended stoppage:

1. Remove brush, fallen trees, rocks, and other debris from traveled way, including turnouts, turnarounds, and other locations that interfere with needed maintenance as follows:

a. No object extending over 4 inches above the road surface shall remain within the 12 feet usable traveled way. Center the usable width on the roadbed or position away from the fill slope.

b. Cut and remove standing or down trees, logs, brush, and limbs from within the area described in 1(a). Remove encroaching limbs to a height of 14 feet above the traveled way surface. Scatter material not meeting utilization standards outside and below the roadbed on the fill side. Limb and remove timber that meets utilization standards or deck at locations approved by the Contracting Officer.

c. Place all removed materials away from drainages.

d. During use, maintain drainage structures including dips, ditches and culverts in a usable condition.

2. Clean and recondition drainage facilities in accordance with Section T-831 and T-834.

B. Slough and Slides

1. Slough and slides may be left in place, provided surface drainage is provided and at least 12 feet of width is available for vehicle passage.

2. Purchaser may reposition or ramp over slides and slough when the traveled way width is less than 12 feet providing the material is capable of supporting vehicles. Limit out slope to no more than six percent.

3. Reposition slough or slide materials, which are not capable of supporting a vehicle, on the roadbed to provide the 12 feet width. When directed by the Contracting Officer, slough or slide material will be removed under Section T-832.

C. Slumps and Washouts

1. Drain the roadbed immediately upgrade of slumps and longitudinal cracks to prevent water from entering slump area.

2. Slumps and longitudinal cracks at the edge of the roadbed shall not be considered a part of the usable width. Usable width may be reduced to 10 feet in the area of the slump.

3. Unless the Contracting Officer approves material being placed on slumps, ramp the slumps on both ends into undisturbed roadbed to provide at least 10 feet usable

width. Use removed materials to guide vehicles to the ramp location or to aid in draining the area.

4. Washouts may be filled with suitable material.

D. Post haul

At the end of hauling or prior to entering into seasonal shutdowns or a period of extended inactivity:

1. Shape the traveled way and disturbed roadbed to provide functional drainage.

2. Reinstall removed cross ditches and water bars and provide any additional drainage structures necessary to offset changes caused through use and maintenance.

3. Leave roads useable for high clearance vehicles. Remove or reshape purchaser modifications at road junctions to leave the entrance as it was before use, or as agreed at the time of improvement.

T-891 WATER SUPPLY AND WATERING (5/07)

891.01 Description

This work consists of providing facilities to furnish an adequate water supply, hauling and applying water.

891.02 Materials

If the Purchaser elects to provide water from other than designated sources, the Purchaser is responsible to obtain the right to use the water, including any cost for royalties involved.
Suitable and adequate water sources available for Purchaser's use under this contract are designated as follows:

Map Key No.	Location Road	Location Milepost	Use Restrictions
W1720	2633720	0.10	None
W1721	2633	3.35	None

891.03 Equipment

A. Positive control of water application is required. Equipment shall provide uniform application of water without ponding or washing.

B. An air gap or positive anti-siphon device shall be provided between the water source and the vehicle being loaded if the vehicle has been used for other than water haul, if the source is a domestic potable water supply, or the water is used for tank mixing with any other materials.

C. The designated water sources may require some work prior to their use. Such work may include cleaning ponded areas, installing temporary weirs or sandbags, pipe repair, pump installation, or other items appropriate to the Purchaser's operations. Flowing streams may be temporarily sandbagged or a weir placed to pond water, provided a minimum flow of N/A cu. ft/sec is maintained. Obtain approval from the Contracting Officer on improvements for sandbags or weirs prior to placement.

201 - Clearing and Grubbing

201.00_nat_us_08_05_2009

201.02 Material:

Delete Tree wound dressing material reference.

201.03 General.

Delete the last sentence.

201.04 Clearing.

Delete the last sentence of (d).

201.01_nat_us_02_18_2005

201.01 Description

Replace with the following

This work consists of clearing and grubbing within clearing limits and other designated areas.

201.04_nat_us_02_18_2005

201.04 Clearing.

Add the following:

When marked in advance, remove dead trees over 6 inches in diameter measured at 12 inches above the ground that lean toward the road and are tall enough to reach the roadbed.

201.04_nat_us_02_22_2005

201.04 Clearing. (c)

Delete paragraph (c) and replace with the following:

> (c) In areas outside the excavation, embankment, and slope rounding limits, cut stumps to within 12 inches or one-third of the stump diameter of the ground, whichever is higher, measured on the side adjacent to the highest ground. For timber sales, stump heights will meet the requirements of the Timber Sale contract.

201.04 Clearing.

Delete subsection (d) and replace with the following:

(d) Do not cut vegetation less than 3 feet tall and less than 3 inches in diameter, that is within the clearing limits but beyond the roadway and not in a decking area, and that does not interfere with sight distance along the road.

Add the following:

(e) Trim branches of remaining trees or shrubs to give a clear height of 14 feet above the roadbed unless otherwise indicated. Trim tree limbs as near flush with the trunk as practicable.

(f) Remove brush from log decks. Deck logs so that logs are piled parallel to one another; can be removed by standard log loading equipment; will not damage standing trees; will not interfere with drainage, and will not roll. Keep logs in log decks free of brush and soil.

201.04_nat_us_03_03_2005

Construction Requirements

201.04 Clearing.

Add the following:

Utilization standards for merchantable timber are listed below. Fall and buck merchantable material into lengths not to exceed 40 feet. Pieces (logs) meet utilization standards when such pieces would have met Utilization Standards if bucking lengths were varied to include such material.

Minimum Utilization Standards

Length	Diameter (Inside Bark) at Small End	40 % Net Scale in % of Gross Scale
8 feet	5 inches	

201.06_nat_us_11_09_2005

201.06 Disposal

Delete the first sentence of this paragraph and substitute the following:

Limb and deck logs that meet utilization standards at locations approved by the CO or otherwise designated. Deck logs according to 201.04 (f).

201.06_nat_us_02_18_2005

201.06 Disposal.

Delete the first sentence of this subsection and substitute the following:

Dispose of merchantable timber designated for removal according to the provisions of the timber sale contract.

203 - Removal of Structures and Obstructions

203.01_nat_us_02_25_2005

203.01 Description.

Delete and replace with the following:

This work consists of disposing of construction slash and debris, salvaging, removing, and disposing of buildings, fences, structures, pavements, culverts, utilities, curbs, sidewalks, and other obstructions.

203.04_nat_us_02_18_2005

203.04 Removing Material.

Replace the fourth and fifth paragraphs with the following:

Where part of an existing culvert is removed, remove the entire culvert upstream from the removal. The remaining downstream culvert may be left in place if no portion of the culvert is within 12 inches of the subgrade, embankment slope, or new culvert or structure; and the culvert ends are sealed with concrete.

Remove structures and obstructions in the roadbed to 12 inches below subgrade elevation. Remove structures and obstructions outside the roadbed to 12 inches below finished ground or to the natural stream bottom.

203.05_nat_us_02_18_2005

203.05 Disposing of Material.

Add the following:

(e) Windrowing Construction Slash. Place construction slash outside the roadway in neat, compacted windrows approximately parallel to and along the toeline of embankment slopes. Do not permit the top of the windrows to extend above subgrade. Use construction equipment to matt down all material in a windrow to form a compact and uniform pile. Construct breaks of at least 15 feet at least every 200 feet in a windrow. Do not place windrows against trees. Obtain approval for pioneer roads. A pioneer road may be constructed to provide an area for placement of windrows, provided the excavated material is kept within the clearing limits and does not adversely affect the road construction.

(f) Scattering. Scatter construction slash outside the clearing limits without damaging trees. Limb all logs. Place logs and stumps away from trees, positioned so they will not roll, and are not on top of one another. Limb and scatter other construction slash to reduce slash concentrations.

(g) Chipping or Grinding. Use an approved chipping machine to grind slash and stumps greater than 3 inches in diameter and longer than 3 feet. Deposit chips or ground woody material on embankment slopes or outside the roadway to a loose depth less than 6 inches. Minor amounts of chips or ground woody material may be permitted within the roadway if they are thoroughly mixed with soil and do not form a layer.

(h) Debris Mat. Use tree limbs, tops, cull logs, split stumps, wood chunks, and other debris to form a mat upon which construction equipment is operated. Place stumps upside down and blend stumps into the mat.

(i) Decking Firewood Material. Remove brush from decks. Limb and deck logs that do not meet Utilization Standards according to Subsection 201.04 as directed by the CO. Cut logs to lengths less than 30 feet. Ensure that logs stacks are stable and free of brush and soil.

(j) Removal to designated locations. Remove construction slash to designated locations.

(k) Piling. Pile construction slash in designated areas. Place and construct piles so that if the piles are burned, the burning will not damage remaining trees. Keep piles free of dirt from stumps. Cut unmerchantable logs into lengths of less than 20 feet.

(l) Placing Slash on Embankment Slopes. Place construction slash on completed embankment slopes to reduce soil erosion. Place construction slash as flat as practicable on the completed slope. Do not place slash closer than 2 feet below subgrade. Priority for use of available slash is for: (1) through fills; (2) insides of curves; and (3) ditch relief outlets.

(m) Hydrological Sensitive Placement. Where required use this method in combination with other designated methods to dispose of material to reduce erosion and to aid in re-vegetation:

1. Place windrow segments on contours, wrap in type I geotextile.
2. Place logs as log erosion barriers on contours. Place logs so that 80% of their length is on the ground surface.
3. Scatter slash on bare or disturbed areas within or outside the clearing limits as directed.
4. Scatter chips or ground woody material on bare or disturbed areas within or outside the clearing limits as directed.

Place stumps in swales or on sites to form planting pockets. Place windrow segments on contours, wrap in type I geotextile.

203.05_0618_us_03_26_2007

203.05 Disposing of Material

(a) Remove from project.

Delete the last two sentences

203.08_nat_us_02_24_2005

203.08 Payment

Add the following:

Disposal of construction slash will be compensated under the designated pay item in Section 201.

204 - Excavation and Embankment

204.00_0618_us_02_11_2008

Delete Section 204 in its entirety and replace with the following.

Description

204.01 This work consists of excavating material, constructing embankments and drainage excavation. This includes furnishing, hauling, stockpiling, placing, disposing, sloping, shaping, compacting, and finishing sand, earthen, and rocky material.

204.02 Definitions.

(a) Excavation. Excavation consists of the following:

(1) Roadway excavation. All material excavated from within the right-of-way or easement areas, except subexcavation covered in (2) below and structure excavation covered in Sections 208 and 209. Roadway excavation includes all material encountered regardless of its nature or characteristics.

(2) Subexcavation. Material excavated from below subgrade elevation in cut sections or from below the original groundline in embankment sections. Subexcavation does not include the work required by Subsections 204.05, 204.06(b), and 204.06(c).

(3) Borrow excavation. Material used for embankment construction that is obtained from outside the roadway prism. Borrow excavation includes unclassified borrow, select borrow, and select topping.

(b) Embankment construction. Embankment construction consists of placing and compacting roadway or borrow excavation. This work includes:

(1) Preparing foundation for embankment;
(2) Constructing roadway embankments;
(3) Benching for side-hill embankments;
(4) Constructing dikes, ramps, mounds, and berms; and
(5) Backfilling subexcavated areas, holes, pits, and other depressions.

(c) Conserved topsoil. Excavated material conserved from the roadway excavation and embankment foundation areas that is suitable for growth of grass, cover crops, or native vegetation.

(d) Waste. Excess and unsuitable roadway excavation and subexcavation that cannot be used.

Material

204.03 Conform to the following Subsections:

Backfill material	704.03
Select borrow	704.07

Select topping	704.08
Topping	704.05
Unclassified borrow	704.06
Water	725.01

Construction Requirements

204.04 Preparation for Roadway Excavation and Embankment Construction. Clear the area of vegetation and obstructions according to Sections 201 and 203.

204.05 Reserved.

204.06 Roadway Excavation. Excavate as follows:

(a) General. Do not disturb material and vegetation outside the construction limits.

Incorporate only suitable material into embankments. Replace any shortage of suitable material caused by premature disposal of roadway excavation

At the end of each day's operations, shape to drain and compact the work area to a uniform cross-section. Eliminate all ruts and low spots that could hold water.

Retrieve material deposited outside of the clearing limits as directed by the CO.

(b) Rock cuts. Blast rock according to Section 205. Excavate rock cuts to 6 inches below subgrade within the roadbed limits. Backfill to subgrade with topping or with other suitable material. Compact the material according to Subsection 204.11 When blasting rock, use blasting methods according to Subsection 205.08.

(c) Earth cuts. Scarify earth cuts to 6 inches below subgrade within the roadbed limits. Compact the scarified material according to Subsection 204.11.

(d) Pioneer Roads. Road pioneering, slash disposal, and grubbing of stumps may proceed concurrently with excavation. Conduct excavation and placement operations so material to be treated under Section 201 will not be incorporated into the roadway unless specified in the slash treatment method. Maintain drainage during pioneering operations.

Remove snow and ice in advance of the work and deposit beyond the roadway limits in a manner that will not waste material or generate sediment. Do not incorporate snow and ice into embankments. Place snow or ice in a manner to prevent resource damage.

(e) Drainage Excavation. Drainage excavation includes construction of all ditches, minor channel changes, drainage dips, catchbasins, surface water deflectors, and other minor drainage structures. Compact by Method (f) unless otherwise shown on the plans. Excavate on a uniform grade between control points.

204.07 Subexcavation. Excavate material to the limits as designated. Take cross-sections according to Section 152. Prevent unsuitable material from becoming mixed with the backfill. Dispose of unsuitable material according to Subsection 204.14. Backfill the subexcavation with topping, or other suitable material. Compact the material according to Subsection 204.11.

204.08 Borrow Excavation. Use all suitable roadway excavation in embankment construction. Do not use borrow excavation when it results in excess roadway excavation. Deduct excess borrow excavation from the appropriate borrow excavation quantity.

Obtain borrow source acceptance according to Subsection 105.02. Develop and restore borrow sources according to Subsection 105.03. Do not excavate beyond the established limits. When applicable, shape the borrow source to permit accurate measurements when excavation is complete.

204.09 Preparing Foundation for Embankment Construction. Prepare foundation for embankment construction as follows:

(a) Embankment less than 4 feet high over natural ground. Unless otherwise designated by the CO, remove topsoil. Break up the ground surface to a minimum depth of 6 inches by plowing or scarifying. Compact the ground surface according to Subsection 204.11.

(b) Embankments over an existing asphalt, concrete, or gravel road surface. Scarify gravel roads to a minimum depth of 6 inches. Scarify or pulverize asphalt and concrete roads to 6 inches below the pavement. Reduce all particles to a maximum size of 6 inches and produce a uniform material. Compact the surface according to Subsection 204.11.

(c) Embankment across ground not capable of supporting equipment. Dump successive loads of embankment material in a uniformly distributed layer to construct the lower portion of the embankment. Limit the layer thickness to the minimum depth necessary to support the equipment.

(d) Embankment on an existing slope steeper than 1V:3H. Cut horizontal benches in the existing slope to a sufficient width to accommodate placement and compaction operations and equipment. Bench the slope as the embankment is placed and compacted in layers. Begin each bench at the intersection of the original ground and the vertical cut of the previous bench.

204.10 Embankment Construction. Incorporate only suitable roadway excavation material into the embankment. When the supply of suitable roadway excavation is exhausted, furnish unclassified borrow to complete the embankment. Obtain written approval before beginning construction of embankments over 6 feet high at subgrade centerline. Construct embankments as follows:

(a) General. At the end of each day's operations, shape to drain and compact the embankment surface to a uniform cross-section. Eliminate all ruts and low spots that could hold water.

During all stages of construction, route and distribute hauling and leveling equipment over the width and length of each layer of material.

Compact embankment side slopes flatter than 1V:1.75H with a tamping type roller or by walking with a dozer. For slopes 1V:1.75H or steeper, compact the slopes as construction of the embankment progresses.

Where placing embankment on one side of abutments, wing walls, piers, or culvert headwalls, compact the material using methods that prevent excessive pressure against the structure.

Where placing embankment material on both sides of a concrete wall or box structure, conduct operations so compacted embankment material is at the same elevation on both sides of the structure.

Where structural pilings are placed in embankment locations, limit the maximum particle size to 4 inches.

(b) Embankment within the roadway prism. Place embankment material in horizontal layers not exceeding 12 inches in compacted thickness. Incorporate oversize boulders or rock fragments into the 12-inch layers by reducing them in size or placing them individually as required by (c) below. Compact each layer according to Subsection 204.11 before placing the next layer.

Material composed predominately of boulders or rock fragments too large for 12-inch layers may be placed in layers up to 24 inches thick. Incorporate oversize boulders or rock fragments into the 24-inch layer by reducing them in size or placing them individually according to (c) below. Place sufficient earth

and smaller rocks to fill the voids. Compact each layer according to Subsection 204.11 before placing the next layer.

(c) Individual rock fragments and boulders. Place individual rock fragments and boulders greater than 24 inches in diameter as follows:

(1) Reduce rock to less than 48 inches in the largest dimension.

(2) Distribute rock within the embankment to prevent nesting.

(3) Place layers of embankment material around each rock to a depth not greater than that permitted by (b) above. Fill all the voids between rocks.

(4) Compact each layer according to Subsection 204.11 before placing the next layer.

(d) Embankment outside of roadway prism. Where placing embankment outside the staked roadway prism, place material in horizontal layers not exceeding 24 inches in compacted thickness. Compact each layer according to Subsection 204.11.

204.11 Compaction. Compact the embankment using one of the following methods as specified:

(a) Compaction A. Use AASHTO T 27 to determine the amount of material retained on a Number 4 sieve. If there is more than 80 percent retained on the No. 4 sieve use procedure (1). If there is 50 to 80 percent retained on the No. 4 sieve use procedure (2). If there is less than 50 percent retained on the No. 4 sieve use procedure (3).

(1) Adjust the moisture content to a level suitable for compaction. Fill the interstices around rock with earth or other fine material as practical. Use compression-type rollers at speeds less than 6 feet per second and vibratory rollers at speeds less than 3 feet per second. Compact each layer of material full width with one of the following and until there is no visible evidence of further consolidation.

(a) Four roller passes of a vibratory roller having a minimum dynamic force of 40,000 pounds impact per vibration and a minimum frequency of 1000 vibrations per minute.

(b) Eight roller passes of a 20-ton compression-type roller.

(c) Eight roller passes of a vibratory roller having a minimum dynamic force of 30,000 pounds impact per vibration and a minimum frequency of 1000 vibrations per minute.

Increase the compactive effort for layers deeper than 12 inches as follows:

- For each additional 6 inches or fraction thereof, increase the number of roller passes in (a) above by four passes.
- For each additional 6 inches or fraction thereof, increase the number of roller passes in (b) and (c) above, by eight passes.

(2) Use AASHTO T 99 to determine the optimum moisture content of the portion of the material passing a No. 4 sieve. Multiply this number by the percentage of material passing a No. 4 sieve, and add 2 percent to determine the optimum moisture content of the material. Adjust the moisture content of material classified A-1 through A-5 to a moisture content suitable for compaction. Adjust the moisture content of material classified A-6 and A-7 to within 2 percent of the optimum moisture content.

Use compression-type rollers at speeds less than 6 feet per second and vibratory rollers at speeds less than 3 feet per second. Compact each layer of material full width according to (1) above.

(3) Classify the material according to AASHTO M 145. For material classified A-1 or A-2-4, determine the maximum density according to AASHTO T 180, method D. For other material

classifications, determine the optimum moisture content and maximum density according to AASHTO T 99, method C.

Adjust the moisture content of material classified A-1 through A-5 to a moisture content suitable for compaction. Adjust the moisture content of material classified A-6 and A-7 to within 2 percent of the optimum moisture content.

Use compression-type or vibratory rollers. Compact each layer of material full width to at least 95 percent of the maximum density. Determine the in-place density and moisture content according to AASHTO T 310 or other approved test procedures. When required, use AASHTO T 224 to correct for coarse particles.

(b) Compaction B. Place material by end dumping to the minimum depth needed for operation of spreading equipment. Adjust the moisture content of the material to obtain a mass that will not visibly deflect under the load of the hauling and spreading equipment. Operate compaction equipment over the full width of each layer until there is no visible evidence of further consolidation or, if when a sheepsfoot roller is used, the roller "walks out" of the layer. Make at least three complete passes.

(c) Compaction C. Place material by end dumping to the minimum depth needed for operation of spreading equipment. Level and smooth each embankment layer before placing the next layers. Operate hauling and spreading equipment uniformly over the full width of each layer. Construct a solid embankment with adequate compaction by working smaller rock and fines in with the larger rocks to fill the voids, and by operating hauling and spreading equipment uniformly over the full width of each layer as the embankment is constructed.

(d) Compaction D. Hauling and Spreading Equipment. Adjust the moisture content to a level suitable for compaction. Compact the material by operating equipment over the full width of the roadway.

(e) Compaction E. Roller Compaction. Adjust the moisture content to a level suitable for compaction. Operate Rollers over the full width of each layer until visual displacement ceases, but not fewer than three complete passes. Use rollers that meet the following requirements:

(1) Steel wheeled rollers, other than vibratory, capable of exerting a force of not less than 250 pounds per inch of width of the compression roll or rolls.

(2) Vibratory steel wheeled rollers equipped with amplitude and frequency controls with a minimum weight of 6 tons, specifically designed to compact the material on which it is used.

(3) Pneumatic-tired rollers with smooth tread tires of equal size that will provide a uniform compacting pressure for the full width of the roller and capable of exerting a ground pressure of at least 80 psi.

(4) Sheepsfoot, tamping, or grid rollers capable of exerting a force of 250 lbs/inch of width of roller drum.

(f) Compaction F. Mechanical Tamper. Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact each 6 inch layer with a minimum of three complete passes with a mechanical tamper.

204.12 Ditches. Slope, grade, and shape ditches. Remove all projecting roots, stumps, rock, or similar matter. Maintain all ditches in an open condition and free from leaves, sticks, and other debris.

Form furrow ditches by plowing or using other acceptable methods to produce a continuous furrow. Place all excavated material on the downhill side so the bottom of the ditch is approximately 18 inches below the crest of the loose material. Clean the ditch using a hand shovel, ditcher, or other suitable method. Shape to provide drainage without overflow.

204.13 Sloping, Shaping, and Finishing. Complete slopes, ditches, culverts, riprap, and other underground minor structures before placing aggregate courses. Slope, shape, and finish as follows:

(a) Sloping. Leave all earth slopes with uniform roughened surfaces, except as described in (b) below, with no noticeable break as viewed from the road. Except in solid rock, round tops and bottoms of all slopes including the slopes of drainage ditches. Round material overlaying solid rock to the extent practical. Scale all rock slopes. Slope rounding is not required on tolerance class D though M roads.

If a slide or slipout occurs on a cut or embankment slope, remove or replace the material, and repair or restore all damage to the work. Bench or key the slope to stabilize the slide. Reshape the cut or embankment slope to an acceptable condition.

(b) Stepped slopes. Where required by the contract, construct steps on slopes of 1⅓V:1H to 1V:2H. Construct the steps approximately 18 inches high. Blend the steps into natural ground at the end of the cut. If the slope contains nonrippable rock outcrops, blend steps into the rock. Remove loose material found in transitional area. Except for removing large rocks that may fall, scaling stepped slopes is not required.

(c) Shaping. Shape the subgrade to a smooth surface and to the cross-section required. Shape slopes to gradually transition into slope adjustments without noticeable breaks. At the ends of cuts and at intersections of cuts and embankments, adjust slopes in the horizontal and vertical planes to blend into each other or into the natural ground.

(d) Finishing. Finish the roadbed to be smooth and uniform, and shaped to conform to the typical sections. Remove unsuitable material from the roadbed and replace it with suitable material. Finish roadbeds to the tolerance class shown in table 204-2.Ensure that the subgrade is visibly moist during shaping and dressing. Scarify to 6 inches below the bottom of low sections, holes, cracks, or depressions and bring back to grade with suitable material. Maintain proper ditch drainage.

For surfaced roads, remove all material larger than 6 inches from the top 6 inches of the roadbed.

For unsurfaced roads, use one of the following methods to finish the roadbed:

(1) Method A. Remove all material larger than 6 inches from the top 6 inches of the roadbed and replace with suitable material.

(2) Method B. Use a vibratory grid roller or approved equal with a minimum weight of 10 tons. Roll at least 5 full-width passes or until there is no visible evidence of further consolidation.

(3) Method C. For roads designated as Construction Tolerance Class K, L, or M, finish the roadbed by spreading the excavation. Eliminate rock berms.

204.14 Disposal of Unsuitable or Excess Material. Dispose of unsuitable or excess material at designated sites or legally off of the project.

When there is a pay item for waste, shape and compact the waste material in its final location according to Subsection 204.11 (c) Compaction C. Do not mix clearing or other material not subject to payment with the waste material. When there is not a pay item for waste, shape and compact the waste material in its final location according to Subsection 204.11 (c) Compaction C.

204.15 Acceptance. See Table 204-1 for sampling and testing requirements.

Material for embankment and conserved topsoil will be evaluated under Subsections 106.02 and 106.04.

Excavation and embankment construction will be evaluated under Subsections 106.02 and 106.04.

Clearing and removal of obstructions will be evaluated under Sections 201 and 203.

Measurement

204.16 Measure the Section 204 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

(a) Roadway excavation. Measure roadway excavation in its original position as follows:

(1) Include the following volumes in roadway excavation:

(a) Roadway prism excavation;

(b) Rock material excavated and removed from below subgrade in cut sections;

(c) Unsuitable material below subgrade and unsuitable material beneath embankment areas when a pay item for subexcavation is not shown in the bid schedule;

(d) Ditches, except furrow ditches measured under a separate bid item;

*(e)*Topsoil;

(f) Borrow material used in the work when a pay item for borrow is not shown in the bid schedule;

(g) Loose scattered rocks removed and placed as required within the roadway;

(h) Conserved material taken from stockpiles and used in Section 204 work; and

(i) Slide and slipout material not attributable to the Contractor's method of operation.

(2) Do not include the following in roadway excavation:

(a) Overburden and other spoil material from borrow sources;

(b) Overbreakage from the backslope in rock excavation;

(c) Water or other liquid material;

(d) Material used for purposes other than required;

(e) Roadbed material scarified in place and not removed;

(f) Material excavated when stepping cut slopes;

(g) Material excavated when rounding cut slopes;

(h) Preparing foundations for embankment construction;

(i) Material excavated when benching for embankments;

(j) Slide or slipout material attributable to the Contractor's method of operation;

(k) Conserved material taken from stockpiles constructed at the option of the Contractor; and

(l) Material excavated outside the established slope limits.

(3) When both roadway excavation and embankment construction pay items are shown in the bid schedule, measure the following as roadway excavation only:

(a) Unsuitable material below subgrade in cuts and unsuitable material beneath embankment areas when a pay item for subexcavation is not shown in the bid schedule;

(b) Slide and slipout material not attributable to the Contractor's method of operations; and

(c) Drainage ditches, channel changes, and diversion ditches.

(b) Unclassified borrow, select borrow, and select topping. When measuring by the cubic yard measure in its original position. If borrow excavation is measured by the cubic yard in place, take initial cross-sections of the ground surface after stripping overburden. Upon completion of excavation and after the borrow source waste material is returned to the source, retake cross-sections before replacing the overburden.

Do not measure borrow excavation used in place of excess roadway excavation.

(c) Embankment construction. Measure embankment construction in its final position. Do not make deductions from the embankment construction quantity for the volume of minor structures.

(1) Include the following volumes in embankment construction:

(a) Roadway embankments;

(b) Material used to backfill subexcavated areas, holes, pits, and other depressions;

(c) Material used to restore obliterated roadbeds to original contours; and

(d) Material used for dikes, ramps, mounds, and berms.

(2) Do not include the following in embankment construction:

(a) Preparing foundations for embankment construction;

(b) Adjustments for subsidence or settlement of the embankment or of the foundation on which the embankment is placed; and

(c) Material used to round fill slopes.

(d) Rounding cut slopes. Measure rounding cut slopes horizontally along the centerline of the roadway if a pay item for slope rounding is included in the bid schedule. If a pay item for slope rounding is not included in the bid schedule slope rounding will be considered subsidiary to excavation.

(e) Waste. Measure waste by the cubic yard in its final position. Take initial cross-sections of the ground surface after stripping over burden. Upon completion of the waste placement, retake cross-sections before replacing overburden.

(f) Slope scaling. Measure slope scaling by the cubic yard in the hauling vehicle.

Payment

204.17 The accepted quantities will be paid at the contract price per unit of measurement for the Section 204 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Table 204-1
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Topping (704.05) & unclassified borrow (704.06)	Measured and tested for conformance (106.04)	Classification	—	AASHTO M 145	1 per soil type	Processed material before incorporating in work	Yes, when requested	Before using in work
		Moisture-density	—	AASHTO T 180, method D[(1)] or T 99, method C[(1)]	1 per soil type but not less than 1 per	"	"	"
		Compaction	—	AASHTO T 310 or other approved procedures	1 per 6000 yd^2 but not less than 1 per layer	In-place	—	Before placing next layer
Select borrow (704.07 & Select topping (704.08)	Measured and tested for conformance (106.04)	Classification	—	AASHTO M 145	1 per soil type but not less than 1 for each day of production	Processed material before incorporating	Yes, when requested	Before using in work
		Gradation	—	AASHTO T 27	"	"	"	"
		Liquid limit	—	AASHTO T 89	"	"	"	"
		Moisture-density	—	AASHTO T 180, method D[(1)] or T 99, method C[(1)]	1 per soil type but not less than 1 per	"	"	"
		Compaction	—	AASHTO T 310 or other approved procedures	1 per 6000 yd^2 but not less than 1 per layer	In-place	—	Before placing next layer

(1) Minimum of 5 points per proctor

Table 204-1 (continued)
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Earth embankment (204.11, Compaction A)	Measured and tested for conformance (106.04)	Classification	—	AASHTO M 145	1 per soil type	Source of Material	Yes, when requested	Before using in work
		Moisture-density	—	AASHTO T 180, method D(1) or T 99, method C(1)	1 per soil type but not less than 1 per 13,000 yd^3	"	"	"
		Compaction	—	AASHTO T 310 or other approved procedures	1 per 3500 yd^2 but not less than 1 per layer	In-place	—	Before placing next layer
Top of subgrade (204.11 Compaction A)	Measured and tested for conformance (106.04)	Compaction	—	AASHTO T 310 or other approved procedures	1 per 2500 yd^2	In-place	—	Before placing next layer

(1) Minimum of 5 points per proctor.

Table 204-2
Construction Tolerances

	Tolerance Class [a]												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Roadbed width (ft)	+0.5	+0.5	+1.0	+1.0	+1.0	+1.0	+1.5	+1.0	+2.0	+2.0	+2.0	+2.0	+2.0
Subgrade elevation (ft)	±0.1	±0.2	±0.2	±0.5	±0.5	±1.0	±1.0	±1.5	±2.0	±3.0	±2.0	±3.0	(c)
Centerline alignment (ft)	±0.2	±0.2	±0.5	±0.5	±1.0	±1.0	±1.5	±1.5	±2.0	±3.0	±3.0	±5.0	(c)
Slopes, excavation, and embankment (% slope[b])	±3	±5	±5	±5	±5	±5	±10	±10	±10	±10	±20	±20	±20

(a) Maximum allowable deviation from construction stakes and drawings.
(b) Maximum allowable deviation from staked slope measured from slope stakes or hinge points.
(c) Unless otherwise shown the centerline alignment and subgrade elevation, as built, have no horizontal curves with a radius of less than 80 feet, and no vertical curves with a curve length of less than 80 feet when the algebraic difference in the grade change is less than 10 percent, or a curve length of less than 100 feet when the algebraic difference of

209.07_0618_us_07_12_2007

209.07 Dewatering.

Delete subsection 209.07 and substitute the following:

Dewatering. Where necessary to dewater, dewater according to Subsection 157.09.

209.10_0618_us_05_01_2007

209.10 Backfill.

(a) General.

Add the following:

Replace any pipe that is distorted by more than 5 percent of nominal dimensions, or that is ruptured or broken.

Do not place or backfill pipe that meets any of the following conditions until the excavation and foundation have been approved in writing by the CO:

- Embankment height greater than 6 feet at subgrade centerline.
- Installation in a protected streamcourse.
- Round pipe with a diameter of 48 inches or greater.
- Pipe arches with a span of 50 inches or greater.
- Any box culvert of structure other than pipe culverts.

(b) Pipe culverts.

(1) Pipe culverts with compacted backfill.

Add the following:

On each side of the pipe, excavate an area at least as wide AS SHOWN ON THE PLANS. Backfill without damaging or displacing the pipe. Complete backfilling of the trench with suitable material.

209.11 Compacting.

Delete the subsection and add the following:

Compact backfill using designated compaction method A, B, or C:

Method A. Ensure that backfill density exceeds the density of the surrounding embankment.

Method B. Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact each layer using appropriate compaction equipment until visual displacement ceases. For compaction under sections 252, 254, 255, 257, 258 and 262 compact with a vibratory steel wheeled roller with a mass of at least 8 tons.

Method C. Determine optimum moisture content and maximum density according to AASHTO T 99 method C. Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact material placed in all layers to at least 95 percent of the maximum density. Determine the in place density and moisture content according to AASHTO T 310 or other approved test procedures.

Table 209-1 Sampling and Testing Requirements

Add the following:

(2) Compaction methods (A) and (B) do not require AASHTO T-99 or T-310 test methods for foundation fill.

251 - Riprap

251.03_nat_us_08_05_2009

Construction Requirements

251.03 General.

Add the following:

Place riprap under or adjacent to structures before placing prefabricated superstructure units or constructing superstructure falsework unless otherwise approved by the CO.

251.08 Measurement.

Add the following:

Payment for excavation and embankment required for placement of riprap is indirectly included in the pay item for riprap.

303 - Road Reconditioning

303.01_nat_us_03_02_2005

303.01 Work.

Delete and add the following:

This work consists of reconditioning ditches, shoulders, roadbeds, cattleguards, asphalt surfaces, and aggregate surfaces.

303.05_0618_us_03_26_2007

303.05 Roadbed Reconditioning.

Delete fourth sentence and replace with the following:

Scarify to the depth and width shown on the drawings, remove surface irregularities, and shape to provide a uniform surface.

303.06_0618_us_04_04_2007

303.06 Aggregate Surface Reconditioning.

Delete and replace with the following:

Repair soft and unstable areas to the full depth of the aggregate surface and according to Subsection 204.07. Scarify to the depth and width shown in the drawings, and remove surface irregularities. Reshape, finish, and compact the entire aggregate surface according to Section 301, Section 321, or Section 322 as applicable.

Delete Table 303-1 and replace with the following:

Table 303-1
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Existing Roadway	Measured and tested for conformance (106.04)	Moisture-density Method D	—	AASHTO T 99 (1)	1 per each mixture or change in material	Processed material before incorporating in work	Yes, when requested	Before using in work
		Moisture-density Method E	—	R-1 Marshall	"	"	"	"
		Moisture-density Method F	—	AASHTO T 180 (1)	"	"	"	"
		Moisture-density Method G	—	R-1 Marshall	"	"	"	"
		In-place density & moisture content	—	AASHTO T 310 or other approved procedures	1 per 3000 yd²	In-place	—	Before placing next layer

(1) Minimum of 5 points per proctor.

303.10 Measurement

Remove and replace the first sentence in the third paragraph with the following:

Measure roadbed reconditioning, aggregate surface reconditioning, roadway reconditioning, and pulverizing by the mile, by the foot, by the station or by the square yard.

303.11_nat_us_03_29_2005

303.11 Measurement

Modify the second paragraph as follows:

Measure ditch reconditioning and shoulder reconditioning by the mile, station, or foot horizontally along the centerline of the roadway for each side of the roadway.

322 - Minor Aggregate Courses

322.00_nat_us_10_24_2007

Description

322.01 This work consists of constructing one or more courses of aggregate on a prepared surface. Work includes producing aggregate by grid rolling, screening, or crushing methods, or placing pit-run or Government-furnished aggregate.

Surface aggregate grading is designated as shown in Table 703-3.

Subbase and base aggregate grading is designated as shown in Table 703-2.

Screened aggregate grading is designated as shown in Table 703-16.

Material

322.02 Conform to the following Subsections:

Aggregate	703.05
Water	725.01

Construction Requirements

322.03 General. Prepare the surface on which the aggregate course is placed according to Section 204 or 303 as applicable.

Request approval of the roadbed in writing before placing aggregate.

Develop, haul, and apply water in accordance to Section 170.

Submit target values within the gradation ranges shown in Table 703-2 or 703-3 for the required grading. After reviewing the proposed target values the CO will determine the final values for the gradation and notify the Contractor in writing.

No quality requirements or gradation other than maximum size will be required for pit run and grid-rolled material. For grid rolling, use all suitable material that can be reduced to maximum size.

After processing on the road, remove all oversize material from the road and dispose of it as directed by the CO.

If the aggregate is produced and stockpiled before placement, handle and stockpiled according to Section 320. Establish stockpile sites at approved locations.

322.04 Mixing and Spreading. Mix the aggregate and adjust the moisture content to obtain a uniform mixture with a moisture content suitable for the specified compaction method. Spread and shape the mixture on the prepared surface in a uniform layer with no segregation of size, and to a loose depth that will provide the required compacted thickness.

Do not place in layers exceeding 6 inches in compacted thickness for aggregate base and surface courses or twice the maximum particle size for screened aggregate. When more than one layer is necessary, compact each layer according to Subsection 322.05 before placing the next layer. Route hauling and leveling equipment uniformly over the full width.

When placing aggregate over geotextile, place aggregate in a single lift to the full depth specified.

322.05 Compacting. Compact each layer full width. Roll from the sides to the center, parallel to the centerline of the road. Along curbs, headers, walls, and all places not accessible to the roller, compact the material with approved tampers or compactors.

Compact the aggregate using one of the following methods as specified:

Compaction A. Operating spreading and hauling equipment over the full width of the travelway.

Compaction B. Operate rollers and compact as specified in Subsection 204.11(a)(1).

Compaction C. Moisten or dry the aggregate to a uniform moisture content between 5 and 7 percent based on total dry weight of the mixture. Operate rollers and compact as specified in Subsection 204.11(a)(1).

Compaction D. Compact to a density of at least 95 percent of the maximum density, as determined by AASHTO T 99, method C or D.

Compaction E. Compact to a density of at least 96 percent of the maximum density, as determined by the Modified Marshall Hammer Compaction Method (available upon request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, MT 59807).

Compaction F. Compact to a density of at least 95 per-cent of the maximum density, as determined by AASHTO T 180, method C or D.

Compaction G. Compact to a density of at least 100 percent of the maximum density as determined by the Modified Marshall Hammer Compaction Method (available upon request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, MT 59807).

For all compaction methods, blade the surface of each layer during the compaction operations to remove irregularities and produce a smooth, even surface. When a density requirement is specified, determine the in place density and moisture content according to AASHTO T 310 or other approved test procedures.

322.06 Construction Tolerance. If grade finishing stakes are required, finish the surface to within ±0.10 feet from staked line and grade elevation.

If grade finishing stakes are not required, shape the surface to the required template and check the surface with a 10-foot straightedge. Defective areas are surface deviations in excess of 1/2 inch in 10 feet between any two contacts of the straightedge with the surface.

Correct all defective areas by loosening the material, adding or removing material, reshaping, and compacting.

Ensure that the compacted thickness is not consistently above or below the specified thickness. The maximum variation from the compacted specified thickness is ½ inch.

Ensure that the compacted width is not consistently above the specified width. The maximum variation from the specified width will not exceed +12 inches at any point.

322.07 Maintenance. Maintain the aggregate course to the correct line, grade, and cross-section by blading, watering, rolling, or any combination thereof until placement of the next course. Correct all defects according to Subsection 322.06.

322.08 Acceptance. See Table 322-1 or Table 322-2 as applicable, for sampling and testing requirements.

Aggregate gradation and surface course plasticity index will be evaluated under Subsection 106.04. If the aggregate is obtained from a Government stockpile then the above characteristics will be evaluated under Subsection 106.02. Other aggregate quality properties will be evaluated under Subsections 106.02 and 106.04. Placement of aggregate courses will be evaluated under Subsections 106.02 and 106.04.

The allowable upper and lower aggregate gradation limits are the Target Value plus or minus the allowable deviations shown in Tables 703-2 and 703-3.

The allowable upper and lower Plasticity index limits for surface courses are stated in 703.05(b).

Preparation of the surface on which the aggregate course is placed will be evaluated under Section 204 or 303 as applicable.

Measurement

322.09 Measure the Section 322 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

Measure square yard width horizontally to include the top of aggregate width including designed widening. Measure the square yard length horizontally along the centerline of the roadway.

If the measurement for aggregate is by cubic yard using contract quantities then measure aggregate by the cubic yard in-place once compacted, otherwise measurement for aggregate by the cubic yard is measured by the cubic yard in the hauling vehicle.

Measure thickness perpendicular to the grade of the travelway.

Measure width perpendicular to the centerline.

Payment

322.10 The accepted quantities will be paid at the contract price per unit of measurement for the Section 322 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

322-1
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Aggregate source quality 703.05	Measured and tested for conformance (106.04 & 105)	LA abrasion (coarse)	—	AASHTO T 96	1 per type & source of material	Source of material	Yes, when requested	Before using in work
		Sodium sulfate soundness loss (coarse & fine)	—	AASHTO T 104	"	"	"	"
		Durability index (coarse & fine)	—	AASHTO T 210	"	"	"	"
		Fractured faces	—	ASTM D 5821	"	"	"	"
Subbase, Base, and Surface courses	Measured and tested for conformance (106.04)	Sample	—	AASHTO T 2	2 per day	From windrow or roadbed after processing or from approved crusher sampling device	Yes	48 hours

Table 322-1 (continued)
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Subbase, Base, and Surface	Measured and tested for conformance (106.04)	Moisture-density Method D	—	AASHTO T 99 [1]	1 per type and source of material	Source of material	Yes, when requested	Before using in work
		Moisture-density Method E	—	R-1 Marshall	"	"	"	"
		Moisture-density Method F	—	AASHTO T 180[1]	"	"	"	"
		Moisture-density Method G	—	R-1 Marshall	"	"	"	"
		In-place density & moisture content	—	AASHTO T 310 or other approved procedures	3 per day	In-place	—	Before placing next layer

Table 322-2
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Screened Aggregate	Measured and tested for conformance (106.04)	Sample	—	AASHTO T 2	2 per day	From windrow or roadbed after processing or from approved crusher sampling device	Yes	48 hours

602 - Culverts and Drains

602.03_nat_us_09_06_2005

602.03 General.

Add the following:

Ensure that the final installed alignment of all pipe allows no reverse grades, and does not permit horizontal and vertical alignments to vary from a straight line drawn from center of inlet to center of outlet by more than 2 percent of pipe center length or 1.0 feet, whichever is less.

602.03_nat_us_10_02_2008

602.03 General.

Delete second paragraph and add the following:

The lengths and locations of individual pipe "as shown on the plans" are approximate. Do not order pipe until culvert locations are designated on the ground and a written list of the correct lengths is approved by the CO.

602.03_06_us_03_17_2010

602.03 General

Add the following:

Clean and paint damaged coating caused by welding, field cutting, or handling in accordance with AASHTO M 36M and ASTM A 849.

607 - Cleaning, Reconditioning, and Repairing Existing Drainage Structures

607.06_0618_us_03_26_2007

607.06 Reconditioning Drainage Structures.
Add the following:

After field cutting, repair damaged coatings in accordance with AASHTO M 36M and ASTM A 849.

625 - Turf Establishment

625.08_0618_us_01_29_2009

625.08 Mulching. (a) Dry method.
Delete the paragraph and replace with the following:

Apply certified weed free straw mulch as shown on the plans.

703 - Aggregate

703.05_nat_us_08_14_2009

Delete 703.05 and replace with the following:

703.05 Subbase, Base, Surface Course, and Screened Aggregate.

(a) Subbase or base aggregate. Furnish hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel conforming the following:

(1) Gradation	Table 703-2
(2) Liquid limit, AASHTO T 89	25 max.
(3) Plastic limit, AASHTO T 90	Nonplastic
(4) Los Angeles abrasion, AASHTO T 96	40% max.
(5) Sodium sulfate soundness loss (5 cycles), AASHTO T 104	12% max.
(6) Durability index (coarse), AASHTO T 210	35 min.
(7) Durability index (fine), AASHTO T 210	35 min.
(8) Fractured faces, ASTM D 5821	50% min.
(9) Free from organic matter and lumps or balls of clay	

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary. Fine aggregate, material passing the No. 4 sieve, shall consist of natural or crushed sand and fine mineral particles.

(b) Surface course aggregate. Furnish hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel conforming the following:

(1) Gradation	Table 703-3
(2) Liquid limit, AASHTO T 89	35 max.
(3) Plastic Index, AASHTO T 90	
a) If the percent passing the No. 200 sieve is less than 12%	2 to 9
b) If the percent passing the No. 200 sieve is greater than 12%	Less than 2
(4) Los Angeles abrasion, AASHTO T 96	40% max.
(5) Sodium sulfate soundness loss (5 cycles), AASHTO T 104	12% max.
(6) Durability index (coarse), AASHTO T 210	35 min.
(7) Durability index (fine), AASHTO T 210	35 min.
(8) Fractured faces, ASTM D 5821	75% min.
(9) Free from organic matter and lumps or balls of clay	

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Do not furnish material that contains asbestos fibers.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary. Fine aggregate, material passing the No. 4 sieve, shall consist of natural or crushed sand and fine mineral particles.

(c) Screened aggregate – Furnish hard, durable particles or fragments of stone, slag, or gravel conforming the following:

(1) Gradation	Table 703-16
(2) Plastic Index, AASHTO T 90	Less than 9
(3) Los Angeles abrasion, AASHTO T 96	55% max.
(4) Free from organic matter and lumps or balls of clay.	

Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary.

Delete Table 703-2 and replace with the following:

Table 703-2

Target Value Ranges for Subbase and Base Gradation

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)				
	Grading Designation				
	A (Subbase)	B (Subbase)	C (Base)	D (Base)	E (Base)
2½ inch	100				
2 inch	97 – 100	100	100		
1½ inch		97 – 100			
1 inch	65 – 79 (6)		80 – 100 (6)	100	
3/4 inch			64 – 94 (6)	86 – 100 (6)	100
1/2 inch	45 – 59 (7)				
3/8 inch			40 – 69 (6)	51 – 82 (6)	62 – 90 (6)
No. 4	28 – 42 (6)	40 – 60 (8)	31 – 54 (6)	36 – 64 (6)	36 – 74 (6)
No. 40	9 – 17 (4)			12 – 26 (4)	12 – 26 (4)
No. 200	4.0 – 8.0 (3)	4.0 – 12.0 (4)	4.0 –7.0 (3)	4.0 – 7.0 (3)	4.0 – 7.0 (3)

( ) The value in the parentheses is the allowable deviation (±) from the target values..

Delete Table 703-3 and replace with the following:

Table 703-3

Target Value Ranges for Surface Gradation

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)					
	Grading Designation					
	F	G	H	S	T	U
1 1/2 inch	100			100		
1 inch	97-100	100		72 – 92 (6)	100	
3/4 inch	76-89 (6)	97 - 100	97 - 100			100
1/2 inch					71 – 91 (6)	
3/8 inch	56-68 (6)	70 – 80 (6)	80 – 92 (6)	51 – 71 (6)		71 – 90 (6)
No. 4	43-53 (7)	51 – 63 (7)	58 – 70 (7)	36 – 53 (7)	43 – 60 (7)	50 – 68 (7)
No. 8				26 – 40 (6)	30 – 46 (6)	34 – 51 (6)
No. 16	23-32 (6)	28 – 39 (6)	28 – 40 (6)			
No. 40	15-23 (5)	19 – 27 (5)	16 – 26 (5)	14 – 25 (5)	16 – 28 (5)	19 – 30 (5)
No. 200	10.0-16.0 (4)	10.0 – 16.0 (4)	9.0 – 14.0 (4)	8.0 – 15.0 (4)	8.0 – 15.0 (4)	8.0 – 15.0 (4)

( ) The value in the parentheses is the allowable deviation (±) from the target values.
If the plasticity index (PI) is greater than 0, the TV range for the No. 200 sieve size is 8-12 (4).

Add Table 703-16:

Table 703-16

Gradation Requirements for Screened Aggregate

Sieve Size	Percent by Mass Passing Designated Sieve (AASHTO T 27 and T 11)						
	Grading Designation						
	L	M	N	O	P	Q	R
6 inch	100	100					
4 inch			100	100			
3 inch					100	100	
2 inch							100
No. 4		15-45		15-45		15-45	

704 - Soil

704.02_0618_us_04_24_2008

704.02 Bedding Material.

Delete the Soil classification, AASHTO M 145 requirement in (b).

704.03_0618_us_03_26_2007

704.03 Backfill Material.

Delete the Soil classification, AASHTO M 145 requirement in (a) (2) and (b) (2).